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ABSTRACT

A study was made to investigate the uses of the computer in the field of learning disabilities and to improve the education and training of prospective learning disabilities specialists. This was accomplished by applying the ideas, concepts, methods, and procedures of the computer sciences to the curriculum of a program that prepares special personnel for the field of learning disabilities. The specific objectives were: (1) to develop interactive computer programs that would simulate the diagnostic and clinical-teaching processes and to implement those procedures within the curriculum of the learning disabilities program, and (2) to develop a mode for a course that would introduce the learning disabilities specialist to certain fundamentals of computer technology and to implement such a course within the learning disabilities curriculum. This report describes those two aspects of the project, as well as several related computer developments, certain sample programs, and a report of evaluation and dissemination procedures. (Author/WCM)

FINAL REPORT

Special Project 23-1769
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COMPUTER APPLICATIONS IN THE FIELD OF LEARNING DISABILITIES

Janet W. Lerner, Ph.D.
James A. Schuyler, Ph.D.

Preparation of Personnel in the Education of the Handicapped

Special Project Grant

U.S. Department of Health, Education, and Welfare

Northwestern University
Department of Communicative Disorders
School of Speech
Evanston, Illinois 60201

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Janet W. Lerner, Ph.D., Director
James A. Schuyler, Ph.D., Co-Director

August 30, 1973

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ABSTRACT

The purpose of this project was to investigate uses of the computer in the field of learning disabilities and to improve the education and training of prospective learning disabilities specialists by applying ideas, concepts, methods, and procedures of the computer sciences to the curriculum of a program that prepares special personnel for the field of learning disabilities. The specific objectives were (1) to develop interactive computer programs that would simulate the diagnostic and clinical-teaching processes and to implement such procedures within the curriculum of the learning disabilities program, and (2) to develop a model for a course that would introduce the learning disabilities specialist to certain fundamentals of computer technology and to implement such a course within the learning disabilities curriculum.

This report describes those two aspects of the project, as well as several related computer developments, certain sample programs, and a report of evaluation and dissemination procedures.

OBJECTIVES

The technological revolution created by the computer in the last decade has succeeded in revamping many areas of human endeavor. New ways to analyze data, new ways to develop models, new ways to study relationships, new ways to teach and to learn, new ways to store and retrieve data, and new ways to simulate experiences are now possible.

The computer, one of the most powerful and adaptable tools of technology, has made tremendous contributions to many fields of endeavor. However, the impact of computer technology has been scarcely felt in the field of learning disabilities. There have been few applications of computer technology, other than the use of library programs to analyze statistical data in research studies. Most students preparing to be learning disabilities specialists and researchers within college and university programs throughout the nation have not been exposed to computer technology; consequently the potential applications of computer science to this field has been largely uninvestigated.

The field of learning disabilities is concerned with the analysis, diagnosis, and treatment of children who are unable to learn in a normal manner, in spite of the fact that the primary cause of their problem is not due to retarded mental development, sensory defects, emotional disturbance, or lack of opportunity to learn. The definition used within the "Children with Specific Learning Disabilities Act of 1969" (P.S. 91-230) as recommended by the National Advisory Committee on the Handicapped provides the concept of learning disabilities as used in this study:

> The term "children with specific learning disabilities" means those children who have a disorder in one or more of the basic psychological processes involved in understanding or in using language spoken or written, which disorder may manifest itself in imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations. Such disorders include such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. Such terms do not include children who have learning problems which are primarily the result of visual, hearing, or motor handicaps, or mental retardation, of emotional disturbances, or of environmental disadvantage.

It is likely that learning disabilities specialists will be located in career positions that will provide access to computers. Whether they are located in public schools, clinics, hospitals, or universities, computer hardware and software will probably be available for use in research, diagnosis, treatment, and in-service education. With a greater awareness of the potential uses of the computer and certain fundamental knowledge and skill, learning disabilities specialists could better communicate with computer science specialists and encourage them to tackle problems in learning disabilities.

The use of the computer requires the user to convert his mode of thinking and analysis to terms that are objective, specific, and systematic. While in a field that deals with human problems of a child's failure to learn, it is essential to realize the importance of feelings, rapport, and the intuitive skills of the clinician, we must also take advantage of the available technological tools if progress is to be made.

The exploration of ways to bring this new technology to the field of learning disabilities was the purpose of an interdisciplinary research project at Northwestern University. The work was a joint effort of specialists in the fields of learning disabilities and computer science. The focus of the project was the development of teacher-training applications. Three areas of computer applications [illegible] developed: (1) simulation of the diagnostic and clinical teaching pro[illegible]s; (2) a computer course for specialists in learning disabilities and related areas of study; and (3) related applications of the computer to the field of learning disabilities.

The project covered a period of two-years: September 1, 1971 through August 31, 1973. The first year was devoted to (1) the planning and writing of the simulation computer programs designed to enhance the skills of the learning disabilities speci[illegible]st, and (2) planning the course to introduce the computer to learning disabilities specialists. The second year of the project was devoted to (1) implementing the computer simulation programs into the on-going learning disabilities program, and (2) teaching of the course on computer applications in learning disabilities twice during the academic quarter-- the Winter and Summer quarters.

a. Interactive Computer Simulation of the Diagnosis and Clinical-Teaching Processes

The purposes of the project were to develop computer programs that would provide graduate students who are preparing to be learning disabilities specialists with the opportunity to have simulated experiences of the diagnostic and clinical-teaching processes as part of their educational training and to integrate these experiences within an on-going learning disabilities program.

A primary aim of learning disabilities programs in colleges and universities is to train prospective specialists to make a diagnosis of a child with a suspected learning disability and to plan and implement remediation within a clinical-teaching program. The process of diagnosing and teaching is an on-going dynamic process requiring the incorporation of many elements and variables including test scores, observational data, medical reports, and case history information. The selection of data, the functions to be tested, follow-up procedures, hypothesis formulation concerning the nature of the problem, recommendations and referrals, and the designing of a teaching plan are among the decisions that must be made.

Typically the diagnostic and teaching process is discussed in a theory course, and the student gains practical experience while working with children in a clinic or practicum course. Students generally find such clinic experiences extremely valuable. Unfortunately, this clinic practice is often limited within the training program because of the costs involved. There are several reasons

why clinical experiences are often insufficient to adequately train the specialists: clinic space is often limited, college supervisory personnel are in short supply, and student time that can be devoted to clinic work is insufficient. Moreover, students must be closely supervised so that mistakes are avoided for they may be costly for the child involved.

Computer simulation can provide one way to supplement and enrich training experiences for the learning disabilities specialist. Moreover, he can learn through the process of making mistakes while working with a computer simulated child. Simulation can bridge the gap between the theory course and the clinic experiences, offer students the opportunity to learn by making mistakes, and provide a simulated learning disabilities setting to participate in the decision-making process. The simulated cases provide additional experience for each student in the training program at very low expense (15 to 35 cents per simulation when run in groups of three or four students). Details on the computer costs encountered in running these programs are given in the section on Evaluation.

b. Introduction to Computers for Learning Disabilities Specialists Course

The objectives of this strand of the project were to plan and to teach a one-quarter course presenting possible uses of the computer in the field of learning disabilities, and outlining present uses in related fields.

The computer is so rapidly becoming an accepted tool in almost every field of endeavor that some knowledge and familiarity with the technology is considered to be part of a broad education of any sort. Consequently, it seems important to us for leaders in learning disabilities to develop some computer background, both for their own benefit, and to help them deal with potential developments from related fields. Areas of development and application in fields related to learning disabilities includes computer-based instruction, computer-managed or prescribed instruction, selection of teaching materials and methods, simulation, record-keeping (part of information-retrieval), research methods and statistical analysis.

Learning disabilities specialists are more and more likely to find themselves in career positions in hospitals, schools, clinics and other agencies that use computers and have available computer time. The electronic machinery could well be used for investigating certain problems of learning disabilities, for research, for diagnosis, for treatment, for record-keeping, for statistical analysis and for in-service education. With a greater understanding of the nature of computer capabilities on the part of the learning disabilities specialist, he could better communicate with computer science specialists. Such interdisciplinary cooperation would promote the tackling of additional problem areas.

The overall purpose of the course introducing computer to learning disabilities specialists was to provide future learning disabilities specialists with this essential background. The course was planned for the specific backgrounds and needs of the learning disabilities specialists.

The specific objectives of the course include the following:

1. To develop an awareness and appreciation among students of what is happening to computer technology, and to develop an open attitude toward computers and their uses, as well as knowledge of their limitations.

2. To develop familiarity with the ways the computer is being used in fields related to learning disabilities.

3. To develop the ability to clearly analyze problems and reduce them to form easily handled by the computer. We would also like students to be able to adequately evaluate promotional materials put out by computer hardware and software manufacturers.

a) to learn about "systems analysis methods;
b) to learn about tools such a flow-charting, PERT, CPM and related techniques for diagramming system relationships;
c) To learn about programming languages and their uses, plus acquiring direct programming experience.

4. There are some skills we feel are necessary for each student, including:

a) The ability to discern what a "library program does, given access to a write-up" or manual, or as a last resort, by examining the program itself;
b) the specific ability to use the Statistical Package for the Social Sciences (SPSS) to perform various types of analysis, or the ability to use the UCLA Bio-medical programs;
c) the ability to write simple programs in FORTRAN or BASIC, two of the more commonly available computational languages;
d) a knowledge of direct-interaction techniques and experiences with Computer-Assisted-Instruction (PLATO/LINGO systems);
e) a familiarity with time-sharing concepts, costs and benefits;
f) thorough knowledge of where to look for reference manuals, consultants and other aids to computing.

5. To encourage and support student work on computer applications to the field of learning disabilities and related areas. A number of students pursued the computer further, and these individual student projects were supported within the course. These projects are presented in the section on Evaluation.

Simulation of the Diagnostic and Clinical Teaching Process: A Method for Training Leaning Disabilities Specialists

Interactive Computer Simulation of Diagnosis and Clinical-Teaching Processes

This section describes the development of computer programs designed to provide students with an interactive simulated experience of the diagnosis and clinical-teaching processes. The programs were developed during the first year of the project. These simulations were incorporated as part of on-going courses within the Learning Disabilities program at Northwestern University during the second year of the project.

Although the computer programs were designed to simulate the actual conditions of the Diagnostic Clinic at Northwestern University, the parameters were developed in a general way so that they could be easily changed to fit conditions of other diagnostic settings. For example, while the program simulates the Learning Disabilities Diagnostic Clinic at Northwestern University, where children attend the clinic for about three hours in the morning and an additional two hours in the afternoon (a total of five hours for the day), these time limits can be easily changed to meet other clinic conditions. Moreover, although a large variety of tests, reports, and other assessment data was inputted into this program a specific user may wish to substitute or add other informational data into the simulation. The program was written so that such data can be readily added.

The operational simulation is designed to provide additional experience in the making of a diagnosis during the training period; it is not intended to be a substitute for either the teaching of the concepts of making a diagnosis in a formal course or for the experience of working with real children in a clinic or practicum course.

The following computer simulations will be discussed: 1) Simulation of the Diagnosis Process-Batch Mode; 2) Simulation of the Diagnosis Process-Shared-Time; 3) Simulation of the Clinical-Teaching Process.

1. Simulation of a Diagnosis: Batch Processing

The operational simulation is planned for use as an integral part of a graduate course in Diagnosis of Learning Disabilities to enable students to practice making decisions related to the diagnosis of children with learning disabilities. The diagnosis can be accomplished during scheduled class periods. The "computer" child "attends" the clinic for the same length of time that children actually do attend the diagnostic clinic at Northwestern University and he is subject to similar tests, reports, and observations. The clinic staff (students participating in the simulated session) actually meet to plan, to develop hypotheses, to make decisions, to develop a diagnosis, and to recommend teaching procedures.

The computer program stores in computer memory extensive information on a specific child who is being diagnosed. Diagnostic teams, consisting of about five student staff members, make a series of decisions concerning the simulated

case. Diagnostic decision-making requires the specialists to arrive at decisions concerning the case history, observations, and tests to be given and interpreted.

Realistically, certain constraints limit data collection within any organizational setting, and these constraints affect decisions. Constraints include variables such as time, money, and facilities. Some of these constraints are built into the simulation program. For example, the scarce resource is time; each request or decision comes at a cost of time. If Silent Reading Test A is given in the morning session, the computer checks to find how long this particular test takes to administer and if sufficient time remains in the diagnostic session to give it. Either the score and other pertinent related information is given in the print-out or the computer message in the print-out informs the diagnostic team that the time remaining is insufficient to administer that test. The computer, then, checks to find if another test requested by the team could be given in the remaining time. If not, the simulated child goes to lunch.

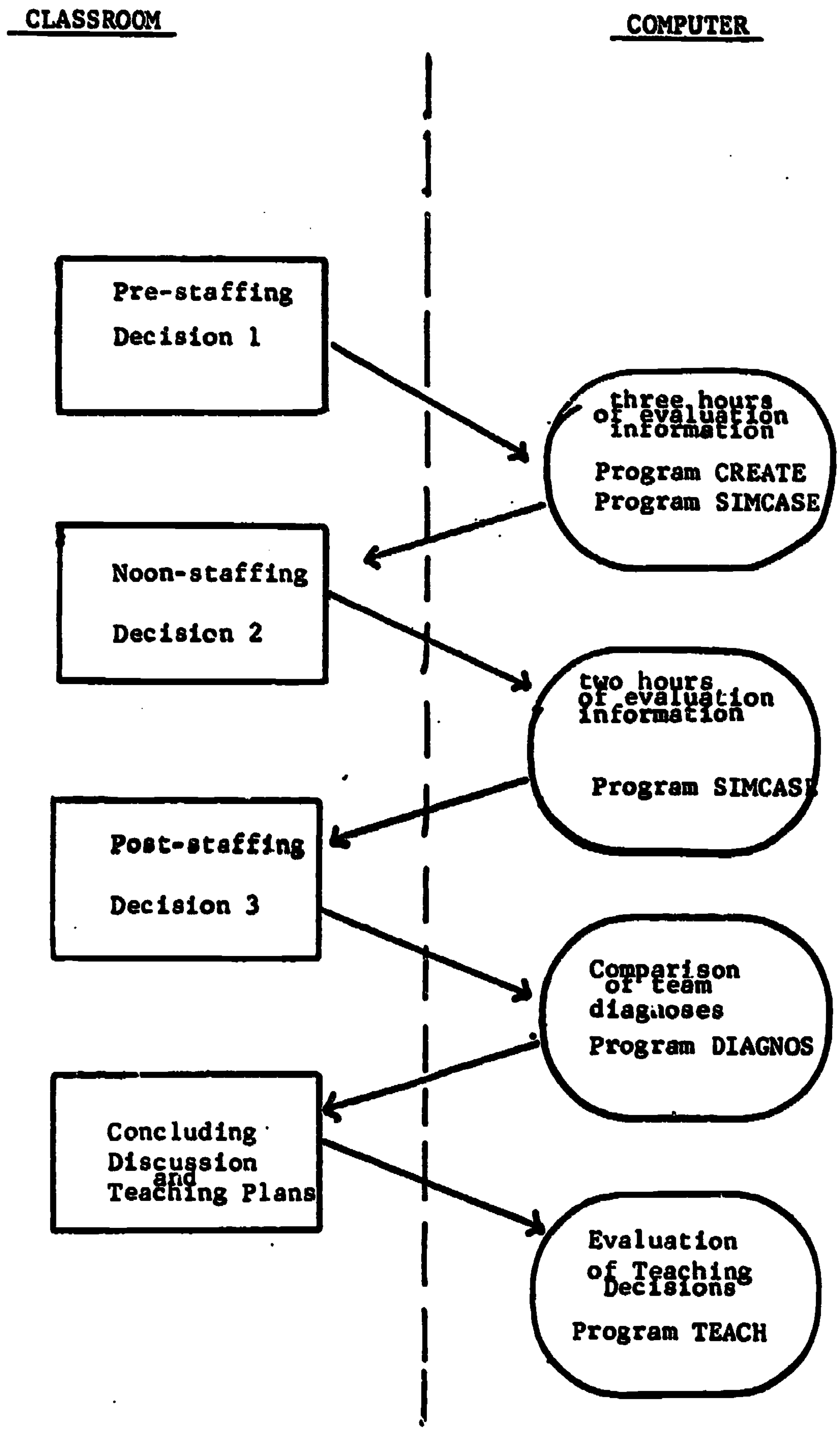
The teams participating in the computer simulation meet for several staffing sessions to make diagnostic decisions. A computer print-out based on their decisions is given to each member of the team at the following simulated staffing session. The routine of staffing sessions and computer print-outs is diagrammed in the flow-chart shown in Figure I. There are four staffing sessions: (1) pre-staffing; (2) noon-staffing; (3) post-staffing; and (4) a concluding session.

Stages of the Diagnosis Training Session

Decision I: Simulated Pre-staffing. In the actual Diagnostic Clinic at Northwestern University the staff meets to plan the diagnosis several days before the child is scheduled to come to the clinic. Information gathered about the child is reviewed and decisions about needed information are made: diagnostic information includes informal and formal tests, reports from other professionals who have worked with the child, reports on behavioral characteristics, parent interview information, etc. The morning diagnostic session is carefully planned. Similarly, at the simulated pre-staffing, the team receives preliminary information about the child, and the team decides what further diagnostic data is needed. The team can obtain scores from a large variety of tests, either total scores or subtest scores. In addition, medical reports, teacher behavior reports, case history data, speech and language reports can be obtained. Each piece of information, however, is tied to a realistic time constraint. Since the morning diagnostic session is scheduled for the simulated time period of 9:00 a.m. to 12:00 noon, the computer releases only three hours of diagnostic information to a team.

The pre-staffing thus consists of planning that morning diagnostic session wisely. Each member of the team receives preliminary information on the child; in addition, he receives a list of the various kinds of diagnostic information he can obtain. Chart I in the Appendix (p. A-I-4) shows 159 units of evaluation information on one child. Although each team is diagnosing the same simulated child, each team receives different information because each reaches different diagnostic decisions regarding the information needed. The Decision I Chart in

Figure 1. FLOWCHART OF SIMULATION OF THE DIAGNOSIS PROCESS



the Appendix (p. A-5) shows the form used to record the staff decisions at the pre-staffing. In the batch processing method, these decisions are key-punched and the deck is submitted for processing.

Decision 2: Simulated Noon-Staffing. In the actual Diagnostic Clinic at Northwestern University, the child goes for lunch from 12:00 noon to 1:00. During this period, the diagnostic staff discusses the observations, scores, case history reports and other findings gathered during the morning. The staff attempts to organize these findings so that decisions lead to an efficient and useful afternoon diagnostic session. In a similar manner, at the simulated noon staffing, each member of the team receives a computer print-out of the results of the morning decisions which enables him to plan for two hours of additional diagnostic examinations (1:00 to 3:00 p.m.). (See sample print-out for Decision 1 in the Appendix, p. A-6,7).

At the noon-staffing, the team begins to develop a hypothesis concerning the child's problem and decides on the information needed to test or substantiate the working hypothesis. The Decision 2 Chart (Appendix p. A-8) shows the form used by the team to indicate the noon-staffing decisions. In the batch processing method the team decisions are keypunched and the deck is submitted for processing.

Decision 3: Post-Staffing. In the actual clinic at Northwestern University the staff meets at the end of the day to pull together the findings of the diagnosis, to formulate an analysis of the child's problem, to plan reports and to make referrals, and to develop appropriate teaching plans. This information is also discussed with the parents. Similarly, at the simulated post-staffing the teams evaluate the information obtained during the simulated sessions and develop a series of diagnostic decisions. These include decisions such as determining whether the child has a disability, his level of development, his areas of strengths and weaknesses, further referrals needed, and recommended teaching procedures.

At the post-staffing session, each member of the team receives a computer print-out giving the information obtained during the afterooon diagnostic session (see Sample Print-out, Decision 2, Appendix p. A-9). Each team now has five hours of diagnostic information to use in the formulation of a diagnosis. Each team develops a diagnosis of the simulated child and answers thirteen questions, which are shown on the Decision 3 Chart (Appendix, p. A-10,11). The decisions are keypunched and the job deck submitted.

Decision 4: Concluding Session. In the actual clinic, the case is discussed in retrospect. Reports are written and follow-up discussions are held with school personnel and other professionals. In the simulated concluding staffing each member of the class receives a print-out showing the decisions made by all the participating teams (see Sample Print-out for Decision 3, Appendix, p. A12-16). During this class discussion, students have the opportunity to question the diagnosis made by other teams and they may be asked to explain the rationale for decisions made by their teams. The diagnoses made by the various teams are compared.

A second part of the concluding sessions involves the making of teaching decisions. All work thus far has been conducted as a team; however, at this

stage students individually make decisions concerning appropriate teaching strategies for the child they have been diagnosing as a team. For each teaching technique, students decide whether they would or would not use the specific method in question. In addition, they specify the reason for their choice. The answers are keypunched and the job deck submitted. Their responses are compared to the decisions made by a Delphi Group, a group of staff and faculty responsible for the diagnostic and teaching clinics at Northwestern University. Each student receives a print-out showing his overall score, as well as sub-scores in seven different areas of teaching: visual processing, auditory processing, reading, motor, cognitive skills and arithmetic, language and speech, and behavior. Decision 4 Chart (Appendix, p. A17-19) shows the form used for making the teaching decisions. Sample Print-out for Decisions 4 (Appendix, p. A20-21) shows a results of Decision 4 received by one student and output showing the performance of the entire class.

Computer Programs Developed for the Batch Processing

Diagnosis Simulated Training Session

All computer programs for the Batch Processing Diagnosis Simulation were written in FORTRAN IV. Four different computer programs are used. They are:

1. CREATE, creates random access file for program SIMCASE.
2. SIMCASE, Decision 1 and Decision 2 (Pre-staffing and Noon staffing).
3. DIAGNOS, Decision 3 (Post-staffing).
4. TEACH, Decision 4 (Concluding staffing).

Each of these programs is discussed below.

CREATE and SIMCASE. These programs are used for Decision 1 and Decision 2, the pre-staffing and noon staffing sessions. A number of different cases have been developed, each of which is designed to represent a different type of learning disability. The cases were developed from actual cases of children who have come through the clinic at Northwestern University. They are:

[illegible] SIMCASE1
SALLY SIMCASE2
[illegible] SIMCASE3
Arthur Simcase4

The data making up each case is shown in the Appendix (pp. A45-57).

The SIMCASE program was developed in two versions. Version 1 uses FORTRAN ARRAYS; version 2 uses a direct access file and the CREATE program. Each version is described below.

Version 1. This program was written in FORTRAN IV, and is shown in PROGRAM 1, page A22-24. The program performs the following operations:

1. Reads the pertinent information regarding the child under study from the data cards.

2. Reads the analytic test names and the child's grade or year performance on each of these tests from data cards.

3. Reads descriptive information regarding the diagnostic teams involved in the analysis from data cards.

4. Prints the child's test results for those tests requested by each diagnostic team. Only the results from those tests which can be administered in a session of 120 minutes or 180 minutes are listed. The message, "There is too little time to administer Test 2" appears for those tests which take more time to administer than remains in the diagnostic session.

Version 2. Certain difficulties were discovered in using Version I of the SIMCASE program.

All test names and performance information were contained in main-memory and a double-dimensioned FORTRAN array. A fixed amount of core was used for each test, no matter what the length of the description. The description of each subtest, which could be given both individually as a subtest or as a part of an entire test battery, was repeated in the main array. (For example, the Frostig Eye-Motor Coordination could be given separately and/or could be given as part of the entire Frostig Developmental Test of Visual Perception.) Therefore, the Frostig Eye-Motor Coordination test was repeated twice in the original version. This required that an excessive amount of main-memory be allocated to the program whenever it was run at Northwestern on the CDC 6400 Computer. Programs with such large core requirements can only be run in the evenings, which makes the turn-around time unnecessarily long.

To eliminate this problem, the program was revised; the new version placed the descriptive information on direct access (random) file to eliminate any duplication of information. This random file is catalogued as a permanent system file and therefore can be used often and need not be created each time the diagnostic program is run. This revision cuts the core requirement of the program to a reasonable level.

The new version also makes the amount of time allocated to a diagnostic session a variable which can be read in at the time the program is run. In the original program, two standard periods were included, 180 minutes and 120 minutes. This change permits flexibility in the diagnostic time period so that the session may last any length of time specified.

Version 2, therefore, was rewritten as two programs. The first program is CREATE and does the following:

1. Creates a random file of analytic test names and performance information from data cards.

2. Catalogs this file as a permanent file in the system.

The second program is SIMCASE and is similar to Version I. The differences include:

1. The number of minutes allotted to a diagnostic session is variable and is read in from a data card.

2. A direct access file is searched to find the diagnostic information requested by each diagnostic team.

The computer programs for both Version I and Version 2 of the diagnosis program as well as several computer print-outs resulting from team diagnostic decision, are shown in the appendix. CREATE (pp. A25-26); SIMCASE (pp. A27-32).

DIAGNOS. This computer program, written in FORTRAN IV compiles the responses to the diagnostic questions made by each team. It provides a print-out of the decisions to each question by all teams for each member of the class. This material provides a basis for the class discussion of the diagnoses made by the various teams. This program is shown in the Appendix (pp. A32-34).

TEACH. This program evaluates the teaching decisions made by various members of the class, comparing an individual's responses to those of the other members of the class and to the Delphi Group's,* the responses of a group of staff and faculty responsible for the clinics and clinical teaching. From the teaching decisions made by the Delphi Group, a weighting system was developed that became the basis for the evaluation of student responses. In addition to an over-all score, the teaching questions were divided into seven categories: visual processing, auditory processing, speech and language, motor, cognitive-arithmetic, reading and behavior. In this way the student receives some idea of how he is doing in each of these learning areas. Program TEACH is shown in the Appendix (pp. A35-42).

Each of the four programs described above is written in FORTRAN IV.

2. Simulation of the Diagnosis: Shared-time Process. (ONLINE)

The "batch processing" simulation requres separate computer-runs for each stage. The participants decide on all tests for the morning session (for example), then these choices are entered for processing by the computer program. At Northwestern, processing takes from ten minutes to one hour, depending upon time of day and the number of students using the computer. The transferrability of such a program to universities where this "turn-around" (job-processing) time is longer might require more time for one simulated step. We have gotten around some of these problems by creating an "interactive" simulation of the diagnosis procedure.

The interactive simulation must perform several tasks the "batch" simulation need not deal with. (1) It must be easy to use, since there will be no programmer or instructor available to help when the students don't under-

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*Delphi is a technique for pooling the opinions of "experts" through several cycles of revision and comment by participants in the group. This technique has recently evolved into something called Delphi-conferencing, in which the computer takes the role of information-storage device and moderator for the conferences. We have not used this technique in this study, but the name implies the ratings represent a pooling of the opinions of "experts".

stand instructions, (2) it must allow the student to learn about individual tests, their scores, functions and interpretations, and (3) it must record information the teacher needs to evaluate the students' performances and direct them toward better techniques.

These goals are facilitated by writing the program for the CAI system on our CDC 6400 computer. Each student can call the computer from the portable data-terminal. The simulation program is accessed by name; the student needs no computer "system" knowledge. Once it is operating, it gives full instructions on its use, plus a sample run, if the student requests one. Whenever the student has trouble, he asks the computer for help. The computer will either answer questions about the program's functioning, or answer questions about specific tests from the list of available reports. The recording of information for the teacher is semi-automatic. The enclosed results (Appendix pp. A57-61) of student runs were produced by that recording facility. Statistics can be developed from these records to show the diagnostic process in more detail.

How the Simulation Works

Information about a number of simulated children (Harvey, Sally, George, etc.) is stored in the computer, along with a single copy of the interactive program. Any number of students may access the program at one time; and a number of them may be using the same child. Recording of student data takes place independently for each student. The student calls the regular Computer-Assisted-Instruction system from a regular telephone, using the computer-terminal provided.. They tell the system that they wish to use the Diagnostic Simulation, and then tell it which child is to be examined. Normally the student examines only one child at a time, formulating a final diagnosis before going on to another case. A morning session (or three hours) and an afternoon session (two hours) are provided automatically. Short breaks are taken occasionally when the child needs to take a drink, or when the phone rings. The student selects the test to be given, and tells the computer, either by typing the number of that test (from a mimeographed list provided) or by typing its name. The computer has a list of names it can search, and the system makes it possible to check for misspellings and "close" matches, then retrieve the proper test or report for the student. The computer responds by typing the child's test-score (for either a single test or a whole battery of tests) or a report, as requested. If time is not available, the computer tells the student to select another test. When results are received (usually in about 3 seconds), the clock starts again; time for the test is subtracted, and the clock runs while the student decides which test to use next. In tests run recently we found that the simulated day (5 hours) takes about 1½ hours at the computer-terminal, and costs about $1.50 including phone and "connect" charges assessed for using groups of students from two to five; this promotes discussion of the case under consideration and allows the students to gain from the same kind of interaction they will experience in the clinic. Thus, costs of the simulation can run from $.30 to $.75 per student. Because the entire interaction is recorded on the computer for later analysis, each student can also receive a printed copy of the session when he next comes to class.

A student may do the morning session altogether, then hold his position (a function of the CAI system does this for him) and do the afternoon session at some later time. Or a session may be interrupted and resumed later on. This allows the student to do any required library work before requesting more

tests. We view the simulation as a part of the learning process, and though we try to simulate the clinical situation as closely as possible, we feel we must allow each student some time to get outside information where required.

One advantage of having an on-line, interactive simulation, is that we are not limited to classroom situations. The data-terminal, being portable, can be carried anywhere a telephone is available. We can use our simulation in class, at the clinic (during spare moments), at the computing center, or at a teacher-training session. We believe this will make it easier for summer and night-school students to gain diagnostic experience, also.

3. Clinical-Teaching Simulation.

The clinical-teaching simulation was designed to give a prospective learning disabilities specialist the opportunity to make clinical-teaching decision. By interacting with a computer, he receives feedback to indicate the effectiveness of his teaching decisions.

In this context, clinical-teaching means the tailoring of learning experiences to the unique needs of a particular child. The initial diagnosis is a means of obtaining preliminary information, but diagnosis should not stop when treatment begins. A continuous and integrated diagnosis and treatment process becomes the essence of clinical-teaching. The clinical teacher modifies the teaching procedures and plans as new needs become apparent. Clinical teaching is also viewed as a test-teach-test process with the teacher skillfully alternating his role between teacher and tester. First the child is tested; a unit of work based on the resulting information is then taught to the child and he again is tested to determine what he has in fact learned. If the child passes the test, the clinical teacher is informed that the teaching has been successful; and he plans the next stage of learning. If the child fails the test, analysis of why he has failed is valuable for subsequent teaching. Clinical teaching differs from regular teaching because it is planned for an individual child rather than for an entire class; for an atypical child rather than for the mythical average child. It is continuous in that each response to a teaching or testing situation gives additional clues about the child, which provide guidelines for subsequent teaching decisions.

Several models of clinical-teaching have been suggested (Chalfant, et al, 1970; McCarthy, et al, 1970; Schwartz, 1971; Robbins and others 1969; Adelman, 1971; Reynolds and Balow, 1972; Sabatino, 1968, 1971).

An important aspect of clinical-teaching is the skill of interpreting feedback information and the need for continuous decision-making. The clinical teacher needs the following competencies:

1. Understanding the child. Be able to specify how a particular child functions -- the things he can do and those he cannot do, his areas of strengths and weaknesses, his developmental levels as they effect school subjects.

2. Understanding the task. Know the process of task development and the components needed to perform specific skills.

3. Relate the task to the child. Use data gathered from both tests and observation on information behavior in teaching to bring about improvement in the child's performance.

4. Make appropriate decision. Be able to make appropriate decisions using this information to bring about improvement in the child.

The Clinical-Teaching Model

The diagram, shown on the following page, represents the underlying model of clinical teaching used to program the computer simulation. The scores on typical tests are placed in the computer to create a simulated learning disabilities child. For each portion of a simulated clinical-teaching lesson, the student makes a lesson plan and can decide to either (a) administer a test to find out something about the child, or (b) teaching something, using one of many possible teaching methods. The time spent on a test is pre-determined, while the time spent on a teaching technique is determined by the student. If a test is given, the computer program checks to see how much time is left in a simulated one-hour period (the actual time available in a single session with a child in the clinic). If a teaching method is selected, the appropriate time is deducted and the decision enters the "effects" calculations. As a result, depending upon the present status of the child and the method selected, the child's test scores and behavior index may be changed, either positively or negatively. The behavior change (index) is printed at each step, but the test score changes are not known unless the student decides to give the appropriate test (which takes more time, of course).

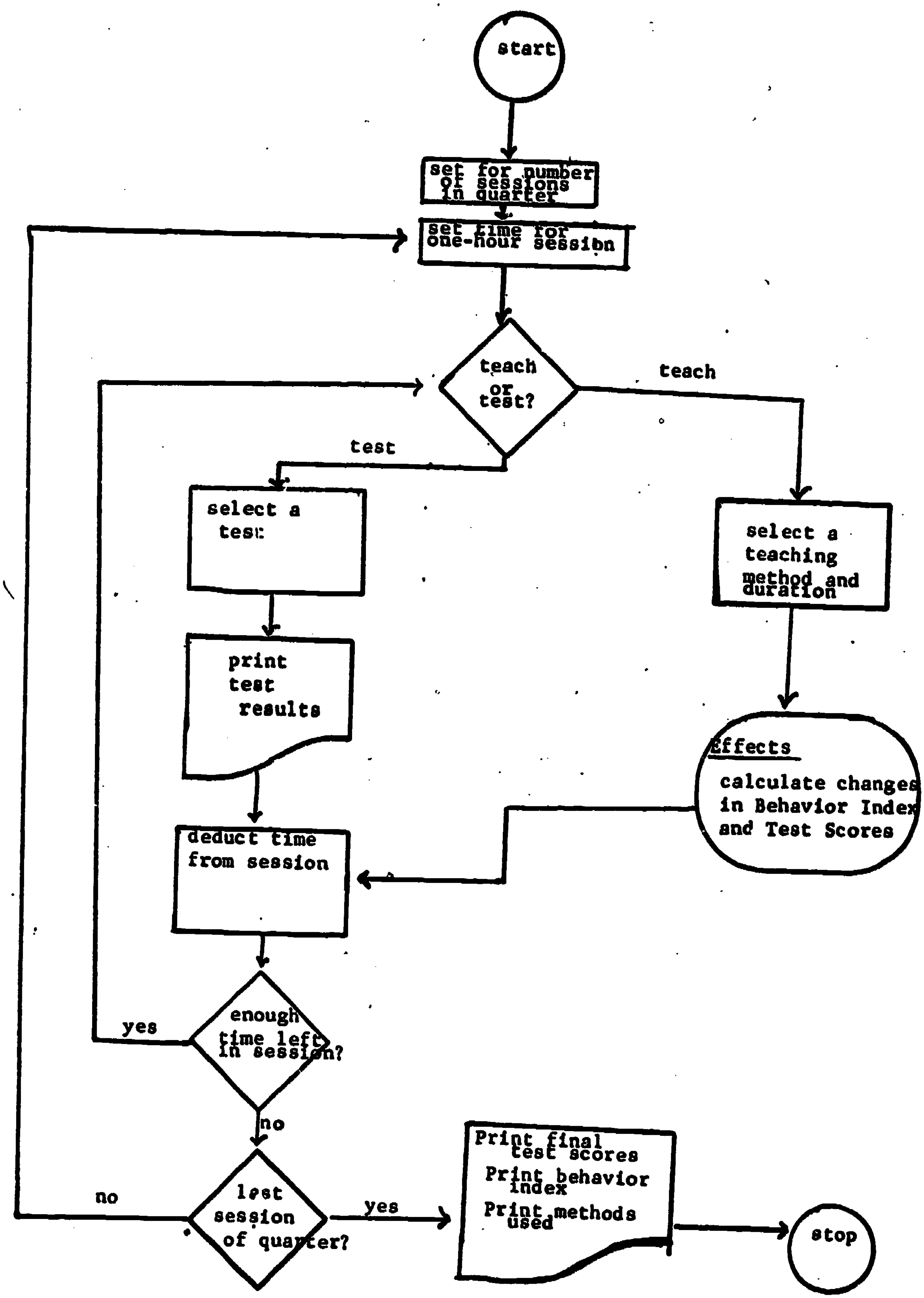
The "effects" calculations are the heart of the simulation program. It consists of a number of postulated connections between teaching methods and scores. The effect of a given teaching method is determined by the child' scores, but in addition, it is affected by the techniques used previously in the case.

A student proceeds through the simulation as outlined below. He sees final results only after twenty simulated hours, which may require a week or more of sessions on the computer (doing two hours' time a day). The student may investigate alternative teaching methods in the program's tutorial mode.

This simulation is planned to be equivalent to twenty hours of clinical-teaching; two one-hour sessions per week for a 10 week quarter. This is roughly similar to the time periods of the clinical-teaching clinic at Northwestern University. At the end of that period of time students can judge their clinical teaching decision skills by noting the amount of improvement the child has made in academic areas. The experience can simulate a ten-week period of time that can be completed in about one hour of real time. A number of assumptions about relationships and functions gathered from the research literature are used in building this simulation, and these underlying assumptions are presented to the user. Users' responses will be stored on tape and these responses will be used to change, revise, and modify the program.

A sample of the output of the clinical-teaching simulation is shown at the end of this section.

LEARNING DISABILITIES CLINICAL-TEACHING MODEL



Development of the Clinical-Teaching Simulation

In the development of the clinical-teaching simulation, a number of problems were encountered. These problems and subsequent decisions are briefly described below.

"General" Model of Learning Disabilities or a "Specific" Model.

The developers initially attempted to devise a generalized clinical-teaching model for the simulation that would handle a variety of children with learning disabilities problems. The complexity of such a system soon became apparent, and this led the way for a decision that a more feasible initial model would be one that could carefully analyze and monitor the progress of a single child with one specific type of learning disability. Tony was selected as the specific case for intensive work. Tony had a severe auditory perception problem which affected reading, spelling, and writing, as well as certain other related areas of learning. It was determined that each additional type of a specific learning disability would thereby require separate program development. It is hoped that eventually a "generalized" system can be developed -- once a number of specific models are developed.

The Postulated Model of Learning Disabilities.

A second decision concerned the underlying assumption of the learning disabilities model to be used. The program developers concluded that a "Teaching to the Deficits Model" would be easiest to program initially. The framework for successful clinical-teaching was to first determine that child's areas of strengths and weaknesses; then to work on areas of deficits--starting with the lowest area. Improvement in this area became prerequisite for building the next area of deficit in the hierarchy. The decision that a "Teaching to the Deficits Model" was assumed in the simulation was made known to the user.

A hierarchy of needed skills for Tony was determined. Several alternative pathways for reaching the top of the hierarchy were planned. Each level of achievement was dependent upon improvement at the preceding level. To illustrate this hierarchy, Tony's severe deficit in auditory perception had to be built up to a certain level of performance before the deficit in phonics could be attacked. Areas of integrities were not included in this hierarchy. The user was told that task of the clinical-teacher in the simulation was to determine the hierarchy of skills that needed improvement.

The Trigger and Booster concepts were built in the hierarchy model. The assumption here was that within the hierarchy a prerequisite area had to build to a minimum level of proficiency before work in the next level would be effective. This is referred to as the "triger" concept as it triggered possible improvement in the next area in the hierarchy. However, before maximum growth in the next level could be attained, a still greater level of proficiency had to be reached in the prerequisite area. This was referred to as the "booster" concept.

The Behavior Index was created because test scores are insensitive to small amounts of improvement. An index was needed that would be sensitive to

daily work that was appropriate for the child. Clinicians were queried as to how they knew when the child was improving in a clinical-teaching situation. They responded that they noted the child's behavior improved -- he was more alert, interested, enthusiastic, had a longer attention span, was less restless, etc. These clinical observations were lumped together into a number called a "behavior index". As appropriate teaching strategies were used, the child's behavior index improved. Testing did not affect the behavior index -- only appropriate teaching. The developers postulated that a "perfect behavior was '1000' ". Since Tony had a learning disability his initial behavior was set at "500". With appropriate and efficient teaching it is possible to raise Tony's "behavior index" to "1000" by the end of the twenty sessions of simulated clinical-teaching.

Length of the Simulation. The plan of the simulation was to simulate the clinical-teaching practicum at Northwestern University. This practicum lasts for one academic quarter (10 weeks) and the child receives instruction for a period of one hour two times per week. Therefore, in one quarter the child receives 20 one-hour clinical-teaching sessions. The computer program was set up to simulate this setting. The twenty hours of simulated teaching could be completed in about one hour of real time.

Tests, Teaching, and Performance Levels. At each session the clinical-teacher could decide to teach or test. Initial performance scores in 17 different areas were determined by the program developers. The user of the simulation was unaware of the initial scores and had to determine performance levels through astute teaching and testing.

Determining Quantitative Relationships. A number of relationships crucial to the simulation had to be determined by the program developers. One was the relationship between time spent teaching an activity and improvement in performance. Another relationship between improvement in performance and improvement in the behavior index had to be determined. By reviewing the literature on learning disabilities remediation programs that reported pre and post-test scores over a similar period of time, the developers determined possible improvement in the various areas over a ten-week session. These scores provided maximum improvement in performance scores.

References for Clinical-Teaching Simulation

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Sabatino, David A. "The Information Processing Behavior Associated with Learning Disabilities." Journal of Learning Disabilities, 1, August, 1968, pp. 444-450.

Sabatino, David A. "An Evaluation of Resource Rooms for Children with Learning Disabilities," Journal of Learning Disabilities, 4, 2, February 1971, pp. 84-90.

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The Design and Implementation of the Clinical Simulation

A general algorithm has been developed to simulate the "Teaching to the Deficits" model incorporating a hierarchy of skills to control development. Sixteen methods or skills were selected as skills pertinant to development. The clinical teacher (user of the simulation) can teach or test these skill areas and base his decisions on the computer-gererated feedback. Initial and final test scores were then estimated from reported research in the literature. The final test scores represent scores achievable only under perfect conditions. These scores provide boundary values for the mathematical solution of the model.

The behavior index is considered to be a function of the teaching done and is therefore a function of the test scores. Each method has a designated behavior index contribution associated with it: teaching the proper method at the proper point in the simulation will produce an increase in the behavior index. Improper teaching will produce no change in the behavior index.

Booster and trigger concepts were used to control development through the simulation and to provide a simple methodology of describing complicated interrelationships between various teaching methods and their application to the specific case. It is an impossible task to describe in detail how each of dozens of possible teaching combinations could affect the test scores and behavior index. Booster and trigger concepts provide a simple and adequate method of describing the situation.

Trigger methods define the hierarchy of skills needed to fulfill the simulation. If the hierarchy of skills were depicted in tree-form, each

node would be a trigger -- you may progress further down the tree if and only if you have spent enough time on skills found higher in the tree. A typical hierarchy of skills appears on the next page. Notice that each branch is not unique -- some branches join together further down the tree. Furthermore, skills appear more than once in a given path down the tree, and progress appears to depend on your position in the tree. The trigger concept eliminates the need to worry about exact positions in the system. Progress on a given method merely depends on progress already made on other methods.

Booster methods control the rate of progress made through the simulation. Boosters help insure that prerequisite methods have been taught adequately. They provide the LD specialist a means of describing development in one skill in terms of other prerequisite skills.

A simple mathematical model has been developed to describe the simulation in terms of boosters and triggers. Two equations are solved each time teaching is simulated. First, a new test scores is computed:

$$S = S_0 + T\,S(t)\,B$$

where S_0 is the initial test scores.

T is the trigger and is either zero or one.

$S(t)$ is the new test score due to teaching t additional minutes.

B is the booster factor and ranges between zero and one.

Knowing the new test score, the behavior index contribution is computed:

$$BI = BI_0 + BI(S)$$

where BI is the behavior index contribution.

BI_0 is the initial behavior index contribution.

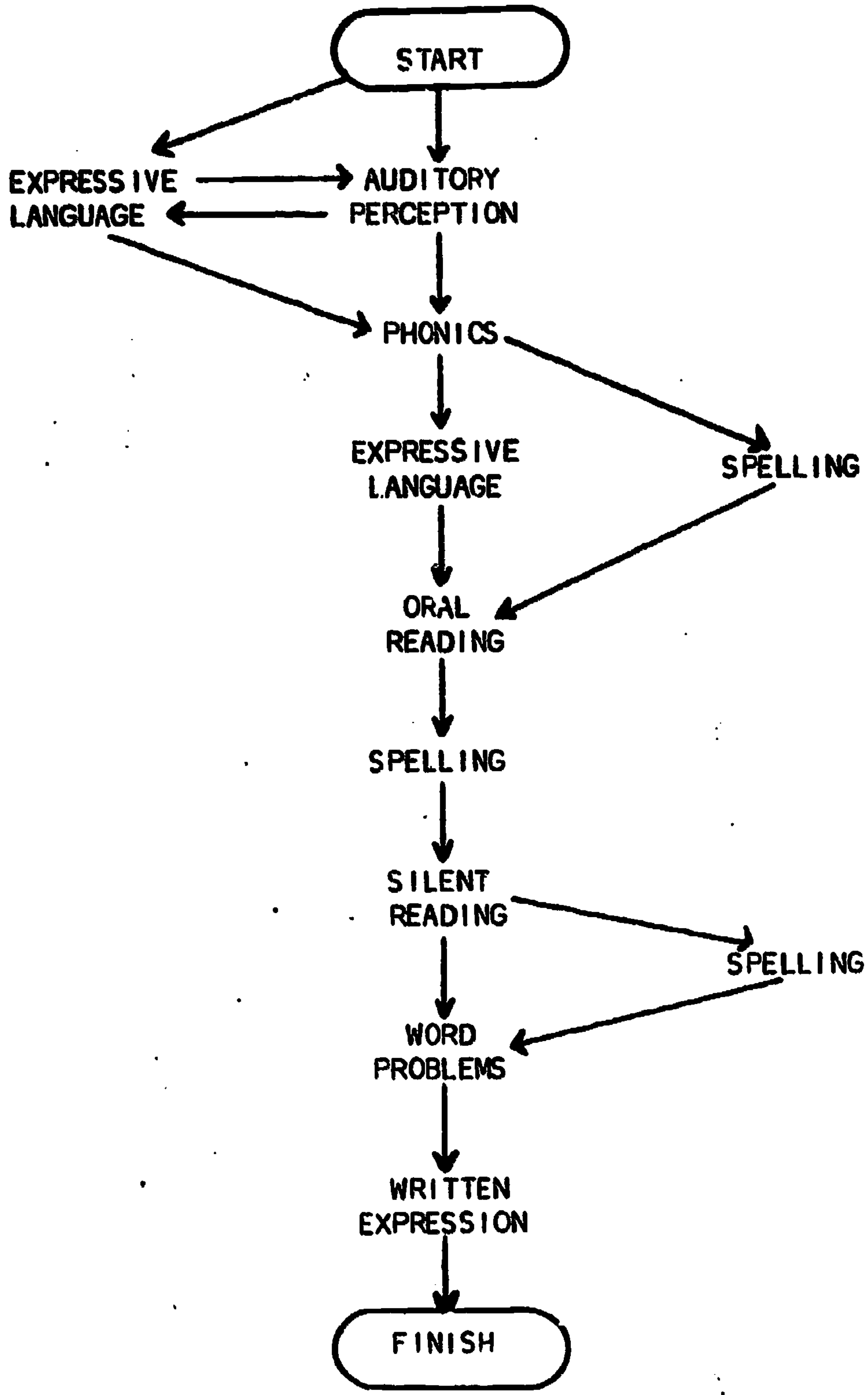
$BI(S)$ is the new behavior index contribution due to the new test score.

This model is general in the sense that it is composed of <u>functions</u>. The trigger is a function of the method being taught and of related methods already taught. The test score is a function of the time already spent on the method taught as well as the additional time being added. The booster is a function of other test scores. These functions are arbitrary, but must be selected to satisfy the boundary conditions of the simulation.

The current simulation uses linear functions in all of its calculations. Simple list-processing techniques are employed in the trigger and booster evaluations. Since test scores result from the product of a series of linear functions they are fairly sensitive to teaching techniques. In actual application, improper teaching is quite obvious -- no behavior index change occurs. Proper teaching is usually rewarded with a generous boost of the behavior index.

TASK SYSTEM ANALYSIS

Tony S.



BOUNDARY CONDITIONS

Tony S.

METHOD	TIME SPENT (HRS)	TEST INITIAL	SCORES FINAL	BEHAVIOR INDEX CONTRIBUTION
Auditory Perception	1.5	5.1	8.3	100
Computation Problems		10.1	10.1	
Expressive Language	2.0	8.6	10.5	20
Eye Training		11.4	11.4	
Language Experience		6.3	6.3	
Motor Training		11.0	11.0	
Oral Reading	3.0	6.3	10.1	80
Phonics	3.0	6.2	8.9	90
Receptive Language		10.5	10.5	
Silent Reading	4.0	6.8	9.8	90
Speed Reading		6.8	6.8	
Spelling	2.5	6.4	8.4	40
Tachistoscope		6.8	6.8	
Visual Perception		11.2	11.2	
Word Problems	2.0	6.7	8.7	40
Written Expression	2.0	6.3	8.7	40
Full IQ Test	——	120	120	——
	20.0			500

The clinical simulation has been written in two languages: FORTRAN subroutines do the test score calculations. The control program is written in LINGO a computer-aided-instruction language with strong response-checking capabilities. The simple structure of the model is reflected in the low cost of using the simulation -- less than two dollars for the entire twenty sessions in an on-line environment.

```
[illegible]
[illegible]4/73  01.09.49.
THIS IS CLINSIM...
ANOTHER EXAMPLE OF
   COMPUTER APPLICATIONS
     IN THE LEARNING DISABILITIES


VERSION 1.3
WRITTEN IN -LINGO-.

GIVE ME YOUR NAME, PLEASE
? SHARON NORTON


     CLINICAL TEACHING SIMULATION

THIS IS A COMPUTER SIMULATION GAME TO ENHANCE
YOUR SKILLS IN CLINICAL-TEACHING.

***FACTS

TONY S., AGE 10,3 AND IN GRADE 4.1,
HAS JUST MOVED INTO THE SCHOOL DISTRICT.

JUDGING FROM HIS AGE -
HAS TONY FAILED A GRADE
? NO
WRONG
A TEN-YEAR OLD WOULD NORMALLY BE IN
GRADE 5.  TONY WAS RETAINED ONCE IN GRADE 3.

TONY CANNOT KEEP UP WITH HIS WORK.
HIS BEHAVIOR IS DISTURBING TO OTHERS.
HE IS INATTENTIVE AND DOESN-T COMPLETE HIS WORK.
HIS ACADEMIC RECORDS ARE NOT AVAILABLE
FROM HIS PREVIOUS SCHOOL.

DO YOU KNOW HOW TO USE THIS PROGRAM
? NO

***PARA3
SIMULATED TIME

YOU CAN WORK WITH TONY FOR THE EQUIVALENT
OF ONE ACADEMIC QUARTER, MEETING TWICE
A WEEK FOR TEN WEEKS.  EACH SESSION IS
60 MINUTES LONG.

HOW MANY SESSIONS DO YOU MEET WITH TONY
? 20
VERY GOOD
***PARA4
```

BEST COPY AVAILABLE

YOUR TASK, AS THE CLINICAL TEACHER, IS TO IMPROVE TONY-S ACADEMIC SKILLS AS RAPIDLY AS POSSIBLE. EACH SESSION PROVIDES YOU THE OPPORTUNITY TO GIVE TESTS OR TEACH USING METHODS OR TO DO A COMBINATION OF TEACHING AND --
? TESTING
RIGHT

TRY TO ANALYZE TONY-S AREAS OF STRENGTHS AND WEAKNESSES. NOTE THE PROGRESS HE MAKES AS YOU GO THROUGH THE SIMULATION.

***NOTE

ASSUMPTIONS

SEVERAL ASSUMPTIONS WERE DESIGNED INTO THIS CLINICAL TEACHING SIMULATION

- APPROPRIATE TEACHING IMPROVES TONY-S BEHAVIOR INDEX

- THIS IS A TEACHING TO THE DEFICITS MODEL

- A SPECIFIC HIERARCHY OF SKILLS IS ASSUMED

***HEAVY

YOU SHOULD TRY TO RAISE THE BEHAVIOR INDEX FROM 500.0 TO 1000.0 WHILE OBTAINING AN OVERALL IMPROVEMENT IN TONY-S ACADEMIC SKILLS.

ASSUME YOU TEACH TONY PERFECTLY.
WHAT IS THE AVERAGE DAILY B.I. CHANGE
? 25
RIGHT
***PARA6

DIRECTIONS

THIS PROGRAM RESPONDS TO YOUR COMMANDS TO -TEACH- OR -TEST-. WHEN YOU TEACH TONY, YOU MUST SPECIFY WHAT METHOD TO USE AND HOW LONG TO USE IT, IN MINUTES.

***TEACH
THE COMMAND:

TEACH SPELLING FOR 15 MINUTES

```
WILL CAUSE THE PROGRAM TO SIMULATE A
SPELLING LESSON 15 MINUTES LONG.  TEACHING
TONY WILL RESULT IN A CHANGE IN HIS
BEHAVIOR.  THE CUMULATIVE BEHAVIOR INDEX
IS PRINTED AFTER EACH TEACH COMMAND IS GIVEN.
THE AMOUNT AND DIRECTION OF THE CHANGE
OF THE B.I. IS YOUR INDICATOR OF TONY-S
PROGRESS DURING TEACHING ACTIVITIES.

HOW MANY THINGS DO YOU HAVE TO INCLUDE
IN YOUR COMMAND TO TEACH TONY
? 3
RIGHT - 3

YOU TELL THIS PROGRAM TO
-TEACH- A -METHOD NAME- FOR -DECIMAL NUMBER- OF MINUTES

***TEST
THE COMMAND:

TEST SPELLING

WILL SIMULATE A SPELLING TEST
OF GIVEN DURATION (15 MIN FOR SPELLING).
TESTING DOES NOT EFFECT BEHAVIOR,
BUT IT DOES SUBTRACT TIME THAT
COULD BE USED FOR TEACHING.
EACH TEST HAS AN ASSOCIATED GRADE
SCORE, AND THAT SCORE IS COMPUTED
AND PRINTED WHEN YOU GIVE THE TEST COMMAND.

HOW MANY THINGS DO YOU INCLUDE
IN YOUR COMMAND TO TEST TONY
? 1
WRONG.  TWO
***ANS4
YOU MUST SPECIFY -TEST- -TEST NAME-

TEST SCORES SHOULD BE USED TO
VERIFY TONY-S ACADEMIC DEVELOPMENT.

PLEASE REMEMBER THAT
 A L L  TEST SCORES ARE  A G E  SCORES.

ALSO,
PLEASE NOTICE THAT THE TESTS AND METHODS
 H A V E  T H E  S A M E  N A M E S .
```

***NAMES
YOU WILL HAVE A CHOICE OF 16 METHODS AND 17 TESTS

NO.	NAME	ABBR	TEST LENGTH
1	AUDITORY PERCEPTION	(AP)	15 MIN
2	COMPUTATION PROBLEMS	(CP)	15 MIN
3	EXPRESSIVE LANGUAGE	(EL)	15 MIN
4	EYE TRAINING	(ET)	15 MIN
5	LANG. EXP. APPROACH	(LEA)	15 MIN
6	MOTOR TRAINING	(MT)	15 MIN
7	ORAL READING	(ORL)	15 MIN
8	PHONICS	(PH)	15 MIN
9	RECEPTIVE LANGUAGE	(RL)	15 MIN
10	SILENT READING	(SR)	15 MIN
11	SPEED READING	(SPR)	15 MIN
12	SPELLING	(SP)	15 MIN
13	TACHISTOSCOPE	(TP)	15 MIN
14	VISUAL PERCEPTION	(VP)	15 MIN
15	WORD PROBLEMS	(WP)	15 MIN
16	WRITTEN EXPRESSION	(WEX)	15 MIN
17	FULL IQ TEST	(IQ)	45 MIN

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TEAR OFF THIS INTRODUCTION FOR LATER REFERENCE

PRESS THE -RETURN- KEY WHEN YOU ARE READY
?

***FINAL

REMEMBER, STRIVE FOR AN O V E R A L L
IMPROVEMENT IN ACADEMIC SKILLS.

TYPE -EXPLAIN, NAME-
FOR AN EXPLANATION OF A METHOD OR TEST.

CRT USERS CAN TYPE -LIST- AND
RECEIVE THE LIST OF NAMES AT ANY TIME.

IF YOU HAVE DIFFICULTY USING THIS PROGRAM,
TYPE -HELP-

*** RESPONSES ARE BEING RECORDED ***

***SUMMARY
DAY 1
YOU HAVE 60 MINUTES
BEHAVIOR INDEX IS 500.0

```
ENTER YOUR FIRST COMMAND
? TEST6
TEST 6 SCORE IS        11.0
YOU HAVE 45 MINUTES LEFT

COMMAND
? TEST1
TEST 1 SCORE IS        5.1
YOU HAVE 30 MINUTES LEFT

COMMAND
? TEACH1
***INVALID COMMAND
*** REPHRASE YOUR COMMAND
?  TEACH 1
***INVALID COMMAND
*** REPHRASE YOUR COMMAND
? TEACH AP
***INVALID COMMAND
*** REPHRASE YOUR COMMAND
? TEACH 1 15 MINUTES
METHOD 1
NEW B.I. IS        516.7
YOU HAVE 15 MINUTES LEFT

COMMAND
? TEACH3 15 MINUTES
METHOD 3
NEW B.I. IS        519.2
YOUR TIME IS UP


***DAY2
YOU ARE DOING WELL.

LETS REVIEW THE COMMANDS:
NAME THE TWO COMMANDS YOU HAVE LEARNED
? TEST TEACH

NO, -TEACH- AND -TEST-
***OTHERS
THERE ARE SYNONYMS FOR THESE COMMANDS.
FOR EXAMPLE, YOU CAN TYPE

-QUIZ SPELLING-

AND

-METHOD 3 FOR 30 MINUTES-
WILL TEACH EXPRESSIVE LANGUAGE.
```

```
SO YOU SEE, -QUIZ- IS A SYNONYM FOR -TEST-
      AND  -METHOD- IS A SYNONYM FOR -TEACH-.

(PRESS THE -RETURN- KEY)
?
***SYNTAX
-TEACH- COMMANDS HAVE A SYNTAX.

YOU MUST BE CAREFULL:

-TEACH 30 MINUTES OF EXPRESSIVE LANGUAGE-
IS  N O T  THE SAME AS
-TEACH 30 MINUTES OF METHOD 3-.

**WHEN YOU USE A METHOD  N U M B E R ,
**IT MUST APPEAR  B E F O R E  THE TIME.

(PRESS THE -RETURN- KEY)
?
***QUIZ
WHAT CAUSES THE B.I. TO CHANGE,
-TESTING- OR -TEACHING-
? TEACHING
GOOD.
NO, -TEACHING-  O N L Y.

***SUMMARY
DAY  2
YOU HAVE  60  MINUTES
BEHAVIOR INDEX IS       519.2

ENTER YOUR FIRST COMMAND
? TEST4
TEST 4 SCORE IS        11.4
YOU HAVE 45 MINUTES LEFT

COMMAND
? TEACH 1 15 MINUTES
METHOD 1
NEW B.I. IS       535.8
YOU HAVE 30 MINUTES LEFT

COMMAND
? TEST 8
TEST 8 SCORE IS         6.2
YOU HAVE 15 MINUTES LEFT

COMMAND
? TEACH 8 15 MINUTES
METHOD 8
NEW B.I. IS       543.3
YOUR TIME IS UP
```

```
***DAY3
A NEW COMMAND:

-FINISH THE DAY WITH PHONICS-

WILL TEACH PHONICS DURING THE REMAINING
TIME OF THE SIMULATED DAY.

WHAT NEW KEYWORD HAVE WE INTRODUCED.
? FINISH

EXACTLY.
***GLOBAL

A REMINDER--
THERE ARE 3 USEFUL GLOBAL COMMANDS:
-HELP-
-EXPLAIN-
-LIST-


***SUMMARY
DAY  3
YOU HAVE  60  MINUTES
BEHAVIOR INDEX IS        543.3

ENTER YOUR FIRST COMMAND
? TEST7
TEST 7 SCORE IS          6.3
YOU HAVE 45 MINUTES LEFT

COMMAND
? TEACH 1 15 MINUTES
METHOD 1
NEW B.I. IS        558.7
YOU HAVE 30 MINUTES LEFT

COMMAND
? TEACH 8 15 MINUTES
METHOD 8
NEW B.I. IS        566.1
YOU HAVE 15 MINUTES LEFT

COMMAND
? TEACH 7 15 MINUTES
METHOD 7
NEW B.I. IS        572.8
YOUR TIME IS UP
```

Development and Teaching of a Course in Computer Applications in Learning Disabilities

The course in computer uses in learning disabilities and related fields was planned and taught during the course of this project. During the first year of the project, the content of the course was explored and discussed with a group of students from another course in Learning Disabilities who volunteered for a special section in which Fortran was taught and a number of related topics were aired. These students used the computer at the Vogelback Computing Center to run a number of programming assignments, each related to problems which might be encountered in Learning Disabilities. A FORTRAN workbook, containing information needed to solve these problems, was developed during this time.

The objectives of the course were outlined in the introduction, and include 1) development of an awareness and appreciation of computer technology, 2) development of familiarity with ways the computer is being used in fields related to Learning Disabilities, 3) development of the ability to clearly analyze problems which might be solved using the computer, and 4) the attainment of certain skills, discussed below.

It is our belief that the Learning Disabilities specialist does not need to know exactly how the computer functions, because few if any of those who take our course will ever have to deal with the internal functioning of any computer. However, mini-computers are prevalent in many fields, and we did feel that specialists needed a brief introduction to the general functions of the major parts of the computer. For that reason, one or two lectures were devoted to explanations of the function of the central processor, various memory devices and the operating system of the CDC 6400 computer, in a very general way. The discussion could be applied to PDP/8 or other similar laboratory computers as well.

Students participating in the course were introduced to applications in two ways. First, a number of lectures were devoted to projects of various natures, being carried out at Northwestern. During the summer quarter, a number of articles were placed on reserve, to be read by the students and discussed in class. These articles were to be reviewed in the light of the students' knowledge of the process of systems analysis and in the light of their knowledge of the field of Learning Disabilities. In addition, as students in the course finished individual projects, which were carried out with the help of the instructors, they were required to give short reports during class time, which were discussed and analyzed by class participants.

The students were initially introduced to the concept of Systems Analysis during the first week of the course. Systems Analysis was pro-

posed as a tool which was to be used to attack (and seek solutions to) any problem, not only those which could be solved by computers. The general outline presented to the students included:

1) determination of the goals or objectives to be attained by any system under consideration.

2) criteria for determining whether a system is attaining its goals. These include concrete (usually quantitative) measures

3) an analysis of the resources available for building the system, and the constraints which would limit the possible solutions.

4) the construction of some sort of model for the system.

5) the review-process, by which a model is tested in order to determine whether it faithfully represents the "real" system, and can be used to test proposed solutions to a problem.

Each of these points was discussed at some length in class, in conjunction with a sample systems analysis (we used the structure of the university as the example). Throughout the course, whenever a problem was presented for solution, we returned to the Systems Analysis model to determine what was to be done.

Finally, we set specific goals with respect to skills we expected each student to have at the end of the ten-week course. These were modified slightly after our initial experience with the winter-quarter course, so that the summer quarter goals would be more realistic for the students who were taking the course.

We emphasized "library" programs both quarters. The advantage of a "library" program is that the specialist needs to do very little programming -- the program is already written, and the specialist need only adjust the format of his data to fit the program's input formats. During the winter-quarter, a number of students explored library programs at the Vogelback Computing Center, and used them in projects.

The largest use of library programs was the SPSS (Statistical Package for the Social Sciences), which we used for two weeks each quarter. Each student was supplied with data and formatting information, and was required to make a number of computer runs to analyze that data. The data consisted of test scores for 90 children from the Learning Disabilities clinic (all data was anonymous). Because the students had been introduced to formatting concepts during the Fortran portion of the course, we were able to concentrate on the other aspects of data-description and analysis. During the summer quarter, we changed the approach so that we did not cover Fortran, and therefore were required to discuss formatting when we reached the SPSS section of the course. We found a widely varying statistical background among our students. During the winter quarter, most students had enough statistical knowledge to be able to interpret the SPSS output reasonably well. However, during the summer, fewer students were acquainted with the statistics, and some difficulty was encountered. In a department such as ours, where a course which includes statistics is also available, it would be reasonable to expect all students to have some knowledge of simple statistical techniques before entering the computer course.

We found that the experience students had with writing their own programs (in BASIC or Fortran, during the first half of the course) helped them appreciate the concept of library programs, which had already been programmed and tested by other people.

Students were also expected to learn to write simple programs in the BASIC or Fortran programming languages. Our initial approach to this was to first teach Fortran, in class, to all students. This was done primarily to show the stude..ts how a programmer would go about writing programs to solve specific problems. A Fortran workbook was prepared and printed, and used both to illustrate programming techniques, and to present problems for solution by the students. Those students who were interested in becoming proficient programmers were given a separate class in Fortran each week, and those who were more interested in specific projects worked with the instructors on those projects during the same time each week. In this way we were able to tailor the content of the course to the needs of the individual students.

During the winter quarter, we emphasized Fortran. By the time of the summer quarter, however, the Vogelback Computing Center had advertized the availability of BASIC language on the CDC 6400, and we took advantage of this, using the computer terminals provided by our project and by the department in the new communicative disorders building. We concentrated on BASIC to the exclusion of Fortran during that quarter. Some of the comments we got at the end of the winter quarter indicated that students would have been happier gaining complete proficiency in a single language than gaining just a smattering of knowledge about two languages. During the summer quarter our students learned about BASIC using a workbook developed specifically for that purpose. The problems used in this workbook were similar to those in the Fortran workbook, and the content of each was related to specific problems from learning disbilities. The decision about the type of programming language to teach will vary from institution to institution, and our decision to use BASIC should not be taken as the last word. This was our choice because of its ease of use (it runs directly from a time-shared editor program) and because it is a simple language to learn. It contains statements or commands which represent all of the basic processing operations a computer can perform. BASIC will also be available to those graduates who work with institutions or companies which have time-sharing services available to them, which we feel will be the case within the next ten years. Fortran was initially used because of its wide availability -- it is practically the only language which has been widely used at Northwestern, and more people know how to program in Fortran than in any other languages. Institutions which have a large number of mini-computers available might even choose to teach an assembly-language, to acquaint students with basic computer conecepts, and to show them how data-gathering devices would be connected to the computer.

Students were introduced to other interactive languages in the course of their projects. One or more lectures were devoted to an explanation of the PLATO-IV and HYPERTUTOR Computer-Aided-Instruction systems. A number of students each quarter chose projects which involved interaction with students or professionals.

By the time the students finished learning the BASIC language, they were quite familiar with time-sharing as viewed by the user of the computer system. Time-sharing was explained in conjunction with the explanation of operating systems and computer structure. We found that some students were so interested in programming itself that they felt that these lectures were useless -- however, we feel that every student should be able to place himself in proper perspective with respect to the computer and to time-sharing networks. Our goal of helping students understand the costs and benefits of time-sharing networks may help them deal with these systems when they must, but the student did not see the immediate need for such an introduction.

By the end of the quarter, each student already knew where to look for more information at Northwestern. During the summer quarter, we conducted a tour of the Vogelback Computing Center, during which we introduced some of the people who are available to help with programming tasks. We showed the students where manuals and other publications are available, and gave them a short introduction to the indexing scheme. At the end of each quarter we introduced them to some of the major computer manufacturers and time-sharing services.

The course was taught by a team of instructors. Dr. Lerner conducted sessions dealing with the simulations developed by this project, and discussed problems dealing specifically with learning disabilities. The introduction to programming was handled by Connie Hayes. Jim Schuyler presented SPSS and the computer system concepts. In addition, another staff member, Dr. Phil Freidman, participated in the course, advising students and conducting an introduction to SPSS during the summer quarter.

Students apparently found it difficult to deal with this structure, primarily in the area of grading. Though we were relaxed about grading (trying to help the student concentrate on learning about the computer rather than on when the next test would be), we found that students needed a clear cut evaluation system. Working in individual projects seemed to be fine for a number of students, but some were worried about how well they were doing with respect to the rest of the class, and the projects provided little feedback in that area. We would recommend that the projects be carried out as we did, but that students be advised in advance whether their projects will be graded on amount of work, originality, etc.

The following page contains the course schedule for the summer quarter.

C07 Introduction to Computers in Communicative Disorders

June 26 T		ORIENTATION- who we/you are - where are the computers and terminals - outline of course- questions
June 28 Th	(JL)	Systems Analysis - do an anal. as homework
June 29 F	(JL/JS)	Discussion of analyses
July 2 M	(CH)	Flowcharts
July 3 T	(JS)	Intro to facilities at Vogelback Computing Ctr. cards, keypunching, terminals, submitting jobs, consultants, ref. manuals, library, etc.
July 5 Th	(CH)	BASIC - flowcharting a problem in preparation for programming on the computer
July 6 F LAB	(JS)	How to run programs on-line. Editing. This is the first LAB session. [in B230]
July 9 M	(CH)	BASIC programming
10 T		
12 Th		
13 F		LAB B230 session - open from 10 to noon.
July 16 M	(CH)	BASIC programming continues.
17 T		
19 Th		
20 F		LAB B230 or QUIZ
July 23 M	(JS)	Operating systems and library programs. How they all communicate and fit together.
July 24 T	(CH)	SPSS - intro. to necessary statistics - typical outputs for various procedures.
JUly 26 Th	(CH/JS)	Formats
July 27 F		Discussion of SPSS procedures and how to specify an analysis.
July 30 M	(JS)	Further discussion and assignment to be made.
31 T		LAB at Vogelback - working on SPSS assignment.
combined Aug 2 Th	(JL)	CLINSIM & Harvey simulations in Learning Dis.
combined 3 F	(JL)	LAB - run CLINSIM.- B230
Aug 6 M	(JL)	LAB B230 - run Harvey or other simulations.
7 T	(WG)	LAB/lecture - L.D. Materials file demonstration
9 Th	(CH)	presentation & analysis of an article or case
10 F	(JS)	Computer Aided Instruction - PLATO slideshow
Aug 13 M	( )	Digital/analog conversion - control of experiments
14 T	( )	Discussion of articles on reserve.
16 Th	( )	"
17 F	( )	"

REQUIRED: (by end of quarter) short (perhaps 3 pages) description of a real problem including analysis, background. plan of attack a flowchart of the system and solutions and perhaps a short program illustrating partial solutions.

JIM SCHUYLER 2-156 UC4820-6401
JANET LERNER 2-157 TERMINALS IN B230
CONNIE HAYES 2-130

We found during the orientation that students generally knew nothing about computers when they began the course. Two students had used library programs before, but had not programmed.

The students were immediately introduced to systems analysis. We spent some time discussing an analysis of the University as a system, and talked about how one sets limits on a system to be studied and improved. Each student was asked to analyze one system (and report results in writing the next day). These results were discussed as a group and any misconceptions were immediately cleared up. Systems analysis was used as the model for discussion of each problem during the rest of the course.

It was actually in conjunction with the discussion of systems analysis that model-building was brought up. We discussed models of many sorts, including trees, graphs, flow-charts, matrices, etc. We spent the greatest amount of time on flow-charts, because that is the type of model used to represent systems most often when computerization is in mind.

Students were given an early introduction to the facilities of the Vogelback Computing Center, even though they would not be using the keypunches and other equipment until well into the quarter. At this time we also introduced them to the equipment located in the communicative disorders building, which would be used for on-line (time-shared) processing during the first half of the course.

The students were then given two weeks of intensive training in the BASIC language. This began with a discussion of the problem-solving process, from flow-chart to final solution using the computer. Students were asked to flow-chart a number of problems which were eventually to be solved using the computer and the BASIC language. A number of students used BASIC in individual projects, later in the course.

After student knew how to program, we introduced the concept of an operating system and time-sharing, so that they would understand (to some degree) how the computer was actually processing jobs. There was not much emphasis on computer hardware, except for those parts which were important to the computer user. We did discuss time and cost of various information storage devices.

After a short introduction to the basic concepts underlying SPSS and library programs, we plunged into a week and a half of SPSS usage. During the summer quarter it was necessary to spend some time discussing Fortran formats (because this is what SPSS uses to describe the position of its data on the cards). It was found that the students' knowledge of BASIC did not help them understand Fortran formats at all. Following that, the students made their first SPSS run, using cards. They were aided at an initial laboratory session at the computing center. This made it very much easier for those who had never even seen a computer card, let alone used a keypunch. Students were required to make three SPSS runs, using different SPSS procedures, to analyze the data provided.

The end of the course was devoted to short lectures, explanations and demonstrations of projects both at Northwestern and elsewhere. The simulations developed during the first year of the project were being used in other learning disabilities courses, and were presented and explained in detail in this course. Some of the projects developed during the winter quarter were also explained summer quarter, including an information-retrieval system for learning disabilities materials. The lectures and demonstrations on computer-aided-instruction were given during the last portion of the course, with a demonstration of the PLATO system at the School of Education.

The last week was devoted to analysis and discussion of a series of articles. These were analyzed in terms of what the students had learned from the course, and using the general systems analysis framework.

During the winter quarter, a number of sessions were devoted to the presentation (by students) of project results. A number of students were able to complete interesting projects, some of which will lead to Masters or Ph.D. projects in communicative disorders. During the summer quarter, because of the shorter duration of the course, the project were limited to descriptions of problems and short programs which might be used in an actual analysis.

Instructors at other institutions will have different attitudes toward the use of the computer in learning disabilities, and we suspect that a course such as ours could be modified by the addition of topics such as analogue/digital conversion, control of experiments, assembly-language programming, graphics, etc., as needed for individual institutions. However, the fundamentals of programming, problem analysis and description, library program usage and basic knowledge about what the computer can do, must be the core of any approach to computers in the learning disabilities.

Related Developments

This section explores some of the developments in learning disabilities which took place as a result of the project or the course. It begins with a discussion of student projects from the winter quarter of the course.

Learning Disabilities Diagnostic Simulation: Ken James

Abstract: To help the novice learning disabilities diagnostician understand the complexities of diagnosis, several cognitive elements of the diagnostic process were assembled in a computer simulation of a learning disabilities diganostic clinic. The program allowed the student to run through a simulated diganostic day in order to formulate a tentative diagnosis of a "prógrammed" child. The diagnostic elements which were stressed in this simulation were data-gathering methods and techniques of analyzing those data. The diagnosis is then compared by the computer to the d.agnosis of the actual child as determinedby the Northwestern University learning disabilities center, and an evaluation is made. Explanation of the program used, and the discussion of implications of the project are also given.

Comment: This simulation by Ken James is an additional case which he programmed, to be added to the existing cases programmed as a part of this project. Ken wrote his program in the TUTOR language, which made it suitable for use on PLATO-IV.

A computer-aided-instruction program in apraxia: Christine Strike

A computer-aided-instruction program was written which helped a student explore and review the basics of apraxia. It was intended to be used by students, beginning speech clinicians or by established clinicians who have never experienced treating an apraxic. The program is not detailed and covers only the broadest, most general characteristics of apraxia.

Comment: This program was primarily multiple-choice questions, written in the TUTOR language. Students who learned TUTOR did so in addition to their experience with Fortran and BASIC.

Diagnostic case of dysfluent child: Robert Pierce

On this project, I devised a diagnostic case of a young dysfluent child. Information was gathered from report forms and testing on a child seen in our clinics. The information was categorized and filed on the computer under headings devised for use at Northwestern. Programming was done in the TUTOR language. This simulation was devised for use in a class on stuttering. Following testing, the student is to fill out a profile on the child. A prototype was included in the program. Feedback and evaluation comes from the professor as the profiles are discussed in class.

Comment: This simulation received much thought, and was apparently widely used in the department during the quarter.

Mental Retardation and Strength of Grip: P. Bannochie & D. Gilbertson

We have data on approximately 1000 mentally retarded children who were given a strength of grip test. We will use SPSS to analyze the data.

Comment: The data was analyzed during the course using a number of the more sophisitcated techniques available through SPSS. A final report was given in class.

Analysis of speech: Dan De Joy

Samples of spontaneous speech have been collected from 10 four-year-old children. What is termed a "loci" and a "non loci" approach on the childrens' normal dysfluencies is being employed. Each sentence receives a syntax score, a length score, and a vocabulary score. The totals of these three scores will be computed and three averages derived. Then, Standard Deviations will be needed. Sentences will then be classified as follows. A sentence which has a syntax score less than one-half S.D. below the average will be classified as S_1. A sentence which has a score between -1/2 S.D. and +1/2 S.D. of the mean will be classified S_2. A sentence which has a syntax score greater than 1/2 S.D. above the average will be classified as S_3. The same for vocabulary and length scores. Childrens' performances will be analyzed in terms of these S, L and V scores.

Comment: This study was expanded as the quarter progressed, and a final report was given to the class. The programming was done entirely in the BASIC language.

Materials Search project: Wilson Guilianelli

Abstract: This program is designed to retrieve information. The information is material which is available to learning disability clinicians or any other teachers who wish to set up a remedial curriculum for a learning disabled child. All of these materials are to be found in the two materials resource rooms of the learning disabilities clinic.

The list of materials is kept on a separate file along with three part descriptions of each material. The first part of the description tells on which age group the material can be used (i.e. primary, two years to second grade; intermediate, second grade to sixth grade; and adult, sixth grade and up.) The second part of the description includes all the different abilities that the material stresses. By abilities I mean the areas of learning visual, auditory, receptive, cognitive, expressive, nonverbal, etc. There are forty-five different ability areas which describe the materials. The final part of the description concerns what school subject the material affects in

remediation.

The user of the program first gets on line in computer-aided-instruction and asks for the program by name. The user is then asked three questions about the type of material he or she would like listed. One question is asked for each description of the material. The program then searches the long list of materials and prints out only those that pertain to the answers given by the user. All three descriptions need not be used. If the user wishes only a list of material pertaining to visual motor, he need only answer the ability question and type "none" in the other two. This can also be done if the user only wishes two descriptions for his material.

Comment: This project has now developed into a proposal to be made for funding. It would involve using the interactive computer system to provide materials searches for teachers in neighboring school districts, over a six month to one year trial period. The description which follows is that given by the author of the program, at the end of the winter quarter course.

Wilson Guilianelli
March 1[illegible], 197[illegible]

MATERIALS SEARCH

The problem that my program was to solve was one of speed and accuracy. The materials of the Learning Disabilities Clinic now number over two-hundred separate materials and new materials are always being added. The speed and accuracy problem comes in when a clinician is searching the huge list of materials to find things which can be used in remediation of a particular case.

All these materials are on file and are catalogued under various headings. This file of materials was made possiblè by Mrs. Jans and a research grant which enabled her to classify and catagorize each material. The heading she used for her file came under three general catagories. The first set of filing headings concerned age and her headings were primary, intermediate, and adults. So, if a material could be used for subjects from age two to the second grade, then these materials fit under the primary heading. Materials that could be used to remediate subjects from second to sixth grade were classified intermediate. Above sixth grade were adult materials.

The second set of file headings concerned which abilities the materials could be used to remediate. There were ten headings in this set that she chose. They were cognitive processing, language, auditory processing, spacial learning, creativity, memory, time learning, nonverbal learning, and remediation(which is not an ability at all but pertains to those materials which the clinician can use for reference)

The third cluster of headings concerns school subject areas. She classified the materials under the classroom subject headings of math, reading, basal readers, science, social studies, and [illegible] handwriting.

In studying this list of headings you can see that each material could be classified under more than one heading. A clinician may have a first grader with visual perception problems who must be taught math. Instead of going into the materials room and looking through hundreds of boxes for the right material, the clinician would go to Mrs. Jan's card catalogue and look first under the primary section, then see if she could crossreference the materials in the primary section with those in the math section and then out of those materials which are in both the primary and math sections she would find how many pertained to visual perception making a third cross-reference in the visual section of the card catalogue. If you are confused, imagine the feelings of the poor clinician!

Although the card catalogue of materials was a better system. than searching the materials room, Mrs. Jans thought a better system could be made using the computer. She also wanted a more detailed description of each material. She wanted the headings broken down further by adding new and more detailed headings so not only would a certain material fall under the visual heading but it could also be found under headings of visual reception and visual perception.

The problem was to take each material and decide which headings it would fall under. All the different headings that a material could come under became a description of that material. So, for example, a game which could be filed under the headings of primary, cognitive, visual, reading, and language would be said to be described by that list of headings. So, each material had a name and a description.

Of course, before we could describe each material we had to break down the old headings and redefine our new list of headings.

The age group headings of primary, intermediate, and adult remained the same. The ability group headings increased from ten to forty-five. Items like visual reception, visual perception, auditory reception, auditory expressions, critical thinking, problem solving, visual-motor, syntax, and auditory, visual and verbal comprehension were added just to name a few. The headings of language was broken down into expressive and receptive language. This was put into the subject area group while more specific headings of syntax, articulation, and formation of ideas took its place in the ability area. The Remediation heading was also removed from the ability area and placed in the subject area for lack of a better place.

The subject area increased from seven headings to almost twenty. Things like written language, cursive and manuscript writing, phonics, and structural analysis were added.

All the materials and their descriptions were stored in a permanent file called ingeniously Learning Disabilities Materials File. The name of the material and description would make up a record on the file. The description was in three parts. All the heading names of the description were divided into age ability and subject so that the program can refer to any one of these three areas separately.

The program itself is done in two languages, LINGO and RIQS. RIQS stores and searches the materials file while LINGO explains the program to the user, stores RIQS commands, and allows for the flexability of the program.

The user gets on line in CAI and asks for the program called, "Learning Disabilities Materials File" . LINGO then asks the user

three questions; What age level of materials do you want? What ability of materials do you want? What subject area materials do you want? The LINGO program then recodes the answers, since the material descriptions are coded, and then stores them. The LINGO program has RIQS search commands on a file. The program then jumps from the LINGO language into the RIQS language and takes the file of RIQS commands with it. The search is then performed by the RIQS program and the answers to the three questions are put into the file of RIQS commands at the proper places to allow the search to retrieve the materials which are desired by the user.

I had mentioned that LINGO allows an amount of flexibility to the program. This is achieved through a LINGO command called "THESAURUS". This command contains lists and lists of synonyms. The thesaurus allows the user to type-in V. PERCEPT, VIS. PERC., VISUAL PERCEPT, OR VISUAL PERCEPTION and the program will interprete all these as meaning visual perception and it will search for the ability of visual perception. This not only saves time but is also convenient for the user.

There is one other option to this program. If the user understands the RIQS language and wants to make a RIQS search of his own he can do so by typing "RIQS" as an answer to the first question.

In conclusion, what I was trying to achieve was a program which would make the searching of the materials file simple and flexible. As it is, all the user has to do is get into the proper program which amounts to typing a few control commands to use the L. D. Materials File. Then the user is asked only three questions. The flexibility of the program accepts a wide range of answers and a wide range of synonyms. After these three questions are asked the materials list is printed out for the user.

I believe that the problems of speed and accuracy have been overcome by this program. Speed is achieved in the simplicity and speed of the program and the computer. Time does not have to be taken to search through the file and do the necessary cross referencing. Accuracy and percision was achieved by the fact that the material descriptionswere carried out in greater detail than the description of the card catalog. I believe that these two points attest to the value that this computer program could have for the masters students and others using the clinic facility.

Wilson Guilignelli

C.A.I. Phonics for Teachers Program

During the course of this project an additional program was developed which helps classroom teachers review the fundamentals of phonics.

This program was originally written in the LINGO language, which would have restricted its use to a small number of universities. It was later translated into the TUTOR language, which made it available to users of the University of Illinois' PLATO network (including the Chicago campus of that universith, Northwestern, Purdue and Indiana University).

A sample of the interaction with that program is included below.

```
WHAT'S YOUR NAME ?
? JIM
OK
WHAT'S YOUR BACKGROUND ?
1...EXPERIENCED TEACHER
2...PROSPECTIVE TEACHER
3...NEITHER
? 1
OK
YOU MAY ALWAYS ANSWER BY TYPING WORDS INSTEAD OF NUMBERS.
THIS IS YOUR CHANCE TO BRUSH UP ON PHONICS BEFORE THE
THIRD GRADERS FIND OUT.
WHAT IS THE STUDY OF HUMAN SPEECH SOUNDS CALLED ?
? PHONICS
NO

IT IS THE ANALYSIS OF ALL SOUNDS.
NO
WHAT IS THE STUDY OF HUMAN SPEECH SOUNDS CALLED ?
? PHONETICS
OK
THE STUDY OF THE SPEECH SOUNDS IN THE SPOKEN LANGUAGE
OF THE ZUNI INDIANS IS CALLED ---------
? PHONETICS
OK
THE APPLICATION OF PHONETICS TO THE TEACHING
OF READING IS CALLED ------- .
? PHONICS?
OK
IS "PHONICS" THE STUDY OF SOUNDS IN
(1) ORAL LANGUAGE, OR (2) WRITTEN LANGUAGE  ? (WHICH ONE?)
? 1
NO
PHONICS DEALS WITH WRITTEN LANGUAGE ONLY (READING).
```

IS "PHONICS" THE STUDY OF SOUNDS IN
(1) ORAL LANGUAGE, OR (2) WRITTEN LANGUAGE ? (WHICH ONE?)
? 2
OK
PROFESSOR HIGGINS, IN "MY FAIR LADY" STUDIED EITHER
PHONETICS OR PHONICS - WHICH ONE WAS IT ?
? PHONETICS
OK
THE LETTERS OF THE ALPHABET ARE WRITTEN SYMBOLS
OF SPEECH SOUNDS. A WRITTEN SYMBOL OF A SPEECH SOUND
IS CALLED A -------- .
(PHONEME, MORPHEME, GRAPHEME, SYNTAX OR DIPHTHONG)
? PHONEME
NO
"GRAPH" MEANS "WRITTEN".
YOU ARE WRONG.
? GRAPHEME
OK
THE BLACK SQUIGGLY MARKS ON PAPER ARE LETTERS.
LETTERS ARE NOT SOUNDS. WHEN LETTERS OR
COMBINATIONS OF LETTERS ARE WRITTEN TO REPRESENT
SPOKEN SOUNDS, THEY ARE CALLED "GRAPHEMES".
A "GRAPHEME" IS ...
1) A SPOKEN SOUND, OR 2) A WRITTEN LETTER REPRESENTING SOUND
? 2
OK
THERE ARE TWO KINDS OF SPEECH SOUNDS,
VOWELS AND CONSONANTS.
WHICH ONE IS DESCRIBED AS "PRODUCED BY THE
RESONANCE CHAMBER AND FORMED BY AN UNOBSTRUCTED
STREAM OF AIR IN THE ORAL CAVITY" ?

Evaluation

This section discusses the evaluation of the various phases of the program.

The first section deals with the evaluation of the diagnosis and clinical-teaching simulations; the second section deals with the evaluation of the course; and the third section deals with several related computer projects resulting from this project.

Evaluation of the Diagnosis Simulations

One aim of the Learning Disabilities Department at Northwestern is to train perspective learning disabilities specialists to diagnose children suspected of having learning problems and to plan and implement remediation once a diagnosis has been made. It was with this goal in mind that both a diagnostic and clinical teaching computer simulation were developed. With the implementation of these simulations, it was necessary to develop a tool for measuring both the general reaction of the class toward this method of instruction and the extent to which these simulations are in fact successful as an aid in teacher training.

Diagnostic Simulation

To evaluate the diagnostic simulation in terms of these objectives, two attitude questionnaries were constructed. The first questionnaire shown on the following page measured general reactions to the specific diagnostic simulation developed and used at Northwestern. As part of the course, Psychological and Educational Fvaluation of Learning Disabilities. The questionnaire was constructed using a Likert type scale. Each student was asked to place his opinion from strongly agree to strongly disagree on a seven point scale. The questionnaire was given to each student at the end of the course.

The questionnaire was given to 68 students. This represents classes held in four different quarters: September 1971, January 1972, September 1972 and January 1973. The questionnaire and results are presented on the following pages.

The student opinions expressed in questions four and seven show that the class felt strongly that the computer simulation was a useful technique for training teachers. The major criticism of the simulation was that the diagnostic information provided was not adequate for making recommendations to parents or teachers and for suggesting specific teaching techniques. This conclusion is based upon relatively low scores found in questions 2b and 2c. Further in class discussion some members of the class felt that a clinician depends on seeing and speaking to a child to aid him both in making a diagnosis and in planning remediation. As a result these students found it difficult to feel that they were working with a real child when using the "computer child". Yet, 69% of the class viewed the case as a "real" child as shown in question 1.

OVER-ALL EVALUATION
SIMULATED DIAGNOSIS

Check the answer that most closely rates your opinion on each question.

1	2	3	4	5	6	7
strongly agree			no opinion			strongly disagree

1. Throughout the various sessions, I felt as though I were working with a real child and his problems.

   1___ 2___ 3___ 4___ 5___ 6___ 7___

2. The diagnostic information provided was in a form that was adequate for:

   a. formulating the diagnosis

   1___ 2___ 3___ 4___ 5___ 6___ 7___

   b. making recommendations to parents or teachers

   1___ 2___ 3___ 4___ 5___ 6___ 7___

   c. suggesting specific teaching techniques

   1___ 2___ 3___ 4___ 5___ 6___ 7___

3. The interactions of the members of the diagnostic teams seemed to realistically simulate the real group experience of working with a diagnostic staff.

   1___ 2___ 3___ 4___ 5___ 6___ 7___

4. The simulation approach increased my awareness of various tests and the roles they might play in a diagnosis.

   1___ 2___ 3___ 4___ 5___ 6___ 7___

5. The computer simulation has aroused my interest in other possible uses of the computer in the field of learning disabilities.

   1___ 2___ 3___ 4___ 5___ 6___ 7___

6. I think it would be helpful to work through another diagnostic simulation.

   1___ 2___ 3___ 4___ 5___ 6___ 7___

7. Overall, the computer simulation of the diagnostic process is a useful technique for teacher training.

   1___ 2___ 3___ 4___ 5___ 6___ 7___

8. I have had some experience in a diagnostic clinic.

   Yes___ No___

9. Further comments, suggestions, criticisms, etc. (use back of page, if desired).

TABLE I

RESULTS OF OVERALL EVALUATION OF SIMULATED DIAGNOSIS

Question (ratings)	Agree: Strongly (1)	Agree: Somewhat (2-3)	Agree: Total	No Opinion (4)	Disagree: Strongly (7)	Disagree: Somewhat (5-6)	Disagree: Total
1	20.6%	48.5%	69.1%	1.5%	2.9%	26.0%	29.4%
2a	17.6%	70.6%	88.2%	2.9%	1.5%	7.4%	5.0%
2b	10.3%	63.3%	73.5%	--	1.5%	7.4%	8.9%
2c	10.3%	56.4%	67.6%	1.5%	4.4%	35.0%	36.5%
3	25.0%	48.5%	73.5%	10.3%	2.9%	13.2%	16.1%
4	44.1%	50.0%	94.1%	2.9%	---	3.0%	3.0%
5	39.7%	48.2%	77.9%	13.2%	---	8.8%	8.8%
6	58.8%	30.9%	87.7%	1.5%	1.5%	7.4%	8.9%
7	58.8%	35.3%	94.1%	1.5%	---	7.4%	4.4%

On the average the group of students with no diagnostic experience reacted more positively to using the computer simulation and in general had more "no opinion" responses than did those with diagnostic experience. The greatest difference in opinions between these two groups occurred on questions 2c and 6. The difference found on question 2c, suggests that the inexperienced diagnostician depends more on objective information, such as test scores, when developing a remedial plan than does the experienced diagnostician. The results of question six suggest that the simulation approach in general is particularly beneficial to the inexperienced group.

The second questionnaire shown on the following page, was designed to measure the extent to which the simulation was an effective method of instruction, as well as to measure the extent to which the class could foresee the advantages of using the computer as an aid to learning. This scale was constructed in a manner similar to that used in the computer course attitide questionnaire discussed in the next section. In this questionnaire the student was required to choose between one of two statements. These statements were not always polar (as was used in the computer questionnaire) advocating opposite opinions, but rather often dealt with the same content but with a slightly different emphasis. We found that this format was not quite as successful a format as that used in the computer course questionnaire for it was difficult for the student to anchor his opinion (as measured by the reliability coefficient obtained on the scale) and therefore more difficult to interpret the results.

The questionnaire was administered twice to all the students enrolled in the Psychological and Educational Evaluation of Learning Disabilities course. It was first administered before introducing the diagnostic simulation to measure both the students understanding of the diagnostic process and their attitudes toward using the computer as an aid to teacher training. The same questionnaire was again givento the same group of students after they had had the opportunity to use the diagnostic simulation. By observing the attitudes expressed in both these pre and post-tests, it was possible to assess the extent to which attitudes changed.

Various statistical procedures were used to insure that the scale was meaningful and that it was a reliable instrument for measuring attitudes. The MLI program was used to check the internal consistency reliability of the scale. A HOYT R = .5299 was computed by this program. This is slightly low but by using the reciprocal averages techniques a reliability figure of .7567 was achieved. The new weightings calculated by this reciprocal averages technique should be used in all subsequent administration of this scale.

To analyze the change of attitudes as reflected by the entire instrument a total score was computed for each student on both the pre and post-tests. We were able to compute these totals by weighting the alternatives of each question. The most desirable response or "ideal response" was always weighted five and the least desirable response was given a weight of one.

Student Background Information (CHECK ONE)

Class: Undergraduate _____ Graduate _____ Special _____
Major: L.D. _____ Speech _____ Hearing Impaired _____ Educ. _____
Psych _____ Other (Specify) _________

Any Diagnostic Experience? Yes _____ No _____
Have you been enrolled as a student in the Northwestern Diagnostic Clinic?
Yes _____ No _____
Have you taken D88 Educational and Psychological Evaluation at N.U.?
Yes _____ No _____
Have you had any computer experience? None _____ A computer course _____
Familiar with computers _____

Each item consists of two alternatives, A and B, between which you are asked to choose by circling one of these indicators:

A - Statement A is entirely preferred to Statement B as an expression of my opinion

a - Statement A is somewhat preferred over Statement B

? - I cannot choose between A and 3

b - Statement B is somewhat preferred to Statement A

A - Statement B is entirely preferred to Statement A as an expression of my opinion

Weights

A a ? b B 1. A. It is possible to create a "computer child" with learning problems similar to those of the children who are seen in our diagnostic clinic. 54321

B. A "computer child" can never had the same type of learning problem as a real child.

A a ? b B 2. A. Diagnosing a "computer child" is a good technique for teaching perspective l.d. specialists about the diagnostic process. 54411

B. Classroom lecture and discussion is the best technique for teaching perspective l.d. specialists about the diagnostic process.

A a ? b B 3. A. I can think of several ways in which the computer can be used to aid in the field of l.d. 54321

The only kind of computer application in the field of l.d. is the use of the computer as a technique in teaching diagnostic procedures.

A a ? b B 4. A. It is possible to present a greater variety of learning problems with a computer simulation approach than an l.d. student would be likely to experience in a clinic course. 54321

B. The computer method could never give as great a variety of cases as one would experience in a clinic course.

A a ? b B 5. A. Only standardized tests should be used when diagnosing a child suspected of having a learning problem 11511

B. One can adequately make a diagnosis by using the case history and various other reports and informal tests.

A a ? b B 6. A. An interdisciplinary team approach to diagnosis is that individual opinions and experience are merged into a group diagnosis. 54533

B. A highly verbal and strongly opinionated member of an interdisciplinary team is likely to influence the direction of a group diagnosis.

A a ? b B 7. A. Time is a scarce resource that must be considered in planning a diagnostic procedure. 54321

B. Time should not be considered when making an adequate diagnosis of a learning problem.

A a ? b B 8. A. A diagnosis which results from interpretation of test results should also lead to recommendations for a remedial plan. 54321

B. The diagnostic process is separate from the remedial analysis.

Statistical Analysis

NULL HYPOTHESIS The students enrolled in the course titled, Psychological and Educational Evaluation in Learning Disabilities exhibit no change in attitude regarding the use of the computer in teacher training and the understanding of the diagnostic process involved in studying a child suspected of having a learning disability after completing the diagnostic computer simulations used as tools for instruction in this course.

STATISTICAL TEST

A correlated T-Test was employed.

SIGNIFICANCE LEVEL

A .05 level was chosen as the probability level at which the null hypothesis was to be rejected. The analysis was performed on 19 cases, although there were more students who used the diagnostic simulations. We were not able to obtain complete data on the other students.

RESULTS

We used the Statistical Package for the Social Sciences (SPSS) T-Test subprogram to analyze the data collected. From this program, we found a significant change in attitude in the positive direction (or direction of "ideal response") at the .006 level. This means that generally after completing the diagnostic computer simulations that the class felt more convinced that a computer simulation and the computer in general have a place in teaching perspective learning disability specialists than before completing the simulation and further the questionnaire indicated that through the use of the diagnostic computer simulation that they were able to learn about the diagnostic process.

Variable	# of Cases	Mean	SD	SE	CORR	2-Tail Prob	Value	DF	2-Tail Prob
Pre	19	30.31	3.53	.809	.847	.000	-3.15	18	.006
Post	19	31.68	2.75	.631					

By using the MLI and cross-tabulation option of SPSS, we were further able to study each question of the scale individually and assess the attitude changes as reflected by each question as well as by the instrument as a whole. From this analysis, we found that questions two and four were the most reliable both had a relability figure of above .60. As measured by the Fishers Exact Test, there was no significant change in attitude at the .05 level on any individual question. In the tables below, we have presented in tabular form by question, the percentages of positive and negative responses. We have defined positive attitudes to be those which are in the direction of the "ideal response" while negative attitudes are responses in the opposite direction of the "ideal response". In some questions of this a no opinion

response was considered a positive attitude while in others a negative attitude. The appropriate classification for each question will be indicated in the discussion below. We further subdivided the positive attitudes into those who entirely agreed with the "ideal response" and those who somewhat agreed. We have presented two tables below. The first depicts the opinions of the entire class, and the second compares those who have had diagnostic experience to those who have not. Looking at the composite table, Table I, one notes a general shift in the positive direction from pre to post test in all questions but number three where there was no change in the proportion of positive and negative opinions. Interpretating the runs of the SPSS computer programs (Table G) both the group with diagnostic experience and the group without diagnostic experience, showed an increase in positive attitudes. By using the Mann Whitney U Statistic we noted that that was a significant difference in attitudes between those two groups on both the pre test (.02 level) and post test (.002 level), generally the group with diagnostic experience, thus, expressed more positive attitudes.

Looking at each question in terms of its "ideal response" we find:

QUESTION I

"Ideal Response"

It is possible to create a "computer child" with learning problems similar to those of the children who are seen in our diagnostic clinic.

We have developed a number of different diagnostic simulation cases which can be used as teaching tools. For instance, Harvey (the case we first developed) simulates a child who has an auditory problem. During the quarter, the members of the class had the opportunity to work through both of these cases. We hoped that by using more than one simulation, the class members would see the possibility of creating computer simulations studying children with a wide range of learning problems, problems similar to those of children who are seen in a clinic. We found that 94.8% of the class felt that the computer child can be created with problems comparable to those of the children seen in our clinic.

QUESTION 2

"Ideal Response"

Diagnosing a "computer child" is a good technique for teaching perspective learning disabilities specialists about the diagnostic process.

Although effective learning is accomplished through classroom lectures and discussions, they do have their limitations, for the members of the class come to the course with varying backgrounds and therefore have varying educational needs. Because of these differences, it is difficult to find the appropriate level of instruction for one always runs the danger of boring some students and losing others. A diagnostic computer simulation is an aid in solving this problem. It offers the more experienced student an opportunity to practice his skills on a great variety of cases that he might not study even in a clinical course and offers the less experienced student the opportunity to learn from those with more experience without impeding class progress. This gives the inexperienced diagnostician, the opportunity to ask more questions than he might otherwise not ask during classroom lectures.

TABLE I

RESULTS OF "POLAR QUESTIONNAIRE" MEASURING ATTITUDES TOWARD THE USE OF A COMPUTER DIAGNOSTIC SIMULATION IN THE STUDYING OF THE DIAGNOSTIC PROCESS

Question	PRE-TEST Positive Entirely Prefer	PRE-TEST Positive Somewhat Prefer	PRE-TEST Positive Total Positive	PRE-TEST Negative Total Negative	POST-TEST Positive Entirely Prefer	POST-TEST Positive Somewhat Prefer	POST-TEST Positive Total Positive	POST-TEST Negative Total Negative	Change in Positive Attitude
1	42.1	36.8	78.9	21.8	47.4	47.4	94.8	5.3	15.9
2	57.9	31.5	89.4	10.6	42.2	52.6	94.8	5.3	15.4
3	47.4	42.1	89.5	10.5	52.7	36.8	89.5	10.5	-
4	47.4	26.3	73.7	26.4	26.3	52.6	78.9	21.1	5.2
5	47.4	36.8	84.2	15.8	47.4	42.1	89.5	10.5	5.3
6	21.1	36.8	57.9	42.1	42.1	42.1	84.2	15.8	26.3
7	31.5	47.3	78.9	21.1	42.1	47.4	89.5	10.5	10.6
8	78.9	15.8	94.7	5.3	94.7	5.3	100	-	5.3

TABLE 2

RESULTS: DIAGNOSTIC VS. NO DIAGNOSTIC EXPERIENCE ON POLAR QUESTIONNAIRE

Question		PRE-TEST				POST-TEST				Change in Positive Attitude
		Positive			Negative	Positive			Negative	
		Entirely Prefer	Somewhat Prefer	Total Positive	Total Negative	Entirely Prefer	Somewhat Prefer	Total Positive	Total Negative	
1	Diag	53.8	30.8	84.6	15.4	53.8	46.2	100	-	15.4
	No Diag	16.7	50.0	66.7	32.4	33.3	50.0	83.3	16.7	16.6
2	Diag	79.9	23.1	100	-	53.8	38.5	92.3	7.7	-7.7
	No Diag	16.7	50.0	56.7	32.3	16.7	83.3	100	-	43.3
3	Diag	61.5	38.5	100	-	69.2	23.1	92.3	7.7	-7.7
	No Diag	16.7	50.0	66.7	33.3	16.6	66.7	83.3	16.7	16.6
4	Diag	53.8	30.8	84.6	15.4	38.5	53.8	92.3	7.7	7.7
	No Diag	33.3	16.7	50.0	50.9	-	50.0	50.0	50.0	-
5	Diag	53.8	23.1	76.9	23.1	46.2	38.5	84.7	15.3	7.8
	No Diag	33.3	66.7	100	-	50.0	50.0	100	-	-
6	Diag	23.1	38.5	61.6	38.4	46.2	46.2	92.4	7.7	30.8
	No Diag	16.7	33.3	50.0	50.0	33.3	33.4	66.7	33.3	16.7
7	Diag	46.2	38.5	84.7	15.4	61.5	38.5	100	-	15.3
	No Diag	-	66.7	66.7	33.3	-	66.7	66.7	33.3	-
8	Diag	76.9	15.4	92.3	7.7	92.3	7.7	100	-	7.7
	No Diag	83.3	16.7	100	-	100	-	100	-	-

The results show that 94% of the class felt that diagnosing a computer child is a good technique.

QUESTION 3
"Ideal Response"

I can think of several ways in which the computer can be used to aid in the field of Learning Disabilities.

Although the purpose of the diagnostic simulation was not to teach the class about computer applications, we hoped that even with this limited exposure, the class members might see the possibilities of using the computer in other ways.

Generally there was a slight shift from a somewhat positive to an entirely positive opinion, although there remained a 10.5% negative opinion from pre to post test.

QUESTION 4
"Ideal Response"

It is possible to present a greater variety of learning problems with a computer simulation approach than a learning disabilities student would be likely to experience in a clinic course.

Although effective learning is accomplished by real life clinical experiences, they too have their limitations. They are expensive in terms of clinic space, student time and supervisory personnel. If students make errors, they may be costly for the children involved, if the student is closely supervised to prevent such errors, he does not have an opportunity to learn through his mistakes.

Further within a one quarter clinical course, the student is apt to see only certain types of cases, many of whom might have similar learning problems. By using a computer simulation, the student can study a greater variety of cases and in less real time than one would spend in the clinic for with the simulation, one need not wait for a child to complete a test. He need only request the test and the score is immediately available. There was only a slight shift to the positive direction, a 5.2% change.

QUESTION 5
"Ideal Response"

Standardized tests, case history information and various other reports should be used to develop an adequate diagnosis of a child suspected in a Learning Disabilities.

Children with learning disabilities are a hetergeneous group. The wide range of both degree and type of learning disability requires a diversity of diagnostic techniques. We would hope that by performing the diagnostic simulations that class members would find that it is necessary to have both

standardized test information and some informal information. We would expect the class to express a "I cannot choose between the two alternatives" on this question. There was a 89.5% positive opinion expressed in answer to this question. This means that 10.5% of the class expressed an opinion which was at one extreme or the other. It is interesting to note that negative opinions were expressed by the group with diagnostic experience. One can hypothesize that this resulted because of the biases that might develop with experience.

QUESTION 6

"Ideal Response"

An interdisciplinary team approach to diagnosis is that individual opinions and experience are merged into a group diagnosis.

One of the goals of the diagnostic simulation was to show the members of the class that both experienced and inexperienced diagnosticians with varying strengths and backgrounds, can work together and develop a group decision. We expected on the pretest that those without diagnostic experience might expect that a highly opinionated and verbal member of a group might unfairly influence the direction of the group. From the table, one can see that this is exactly the results we obtained. We found that 50% of those without experience did indeed express negative attitudes on this question of the pretest. After the diagnostic simulation experience, however, 66.7% of this group (those without diagnostic experience) expressed the opinion that a group decision can be obtained by an interdisciplinary approach, while 89.5% of the entire class felt positively.

QUESTION 7

"Ideal Response"

Time is a scarce resource that must be considered in planning a diagnostic procedure. In the diagnostic simulation cases, the staff sees the child for one day, three hours during the morning and 2 hours during the afternoon.

The diagnostic simulation was designed so that only three hours of information during the morning session and two hours of information during the afternoon session are released, even if a team overestimates the amount of time required to administer the tests that it requests. It is for this reason that the staff must schedule its time carefully so that it may receive all the information it needs for preparing a diagnosis. The class generally felt that time was a scarce commodity. Only 10.5% still had negative opinions on this question after completing the diagnostic simulation cases.

QUESTION 8

"Ideal Response"

A diagnosis which results from the interpretation of test results should also lead to recommendations for a remedial plan.

As part of the simulation, each student was required to make decisions regarding the teaching strategies that he would use in a remedial program for

the child under study. Each student had to choose from some 60 possible techniques those which could appropriately be used for the child and indicate why they should be used. The entire class realized the importance of using the diagnostic information as an aid for developing a remedial plan. The biggest shift from pre to post test can be seen in the entirely preferred ideal response column.

Two versions of the computer simulation have been developed. One version is run as a batch job, which requires a days turn around time and therefore the student does not receive the information that he requests until the following class period, and the second version is run using the on-line facility of the computer where the student receives the information that he requests immediately at the computer terminal. The on-line version is particularly good for those students who enjoy doing the diagnosis individually. We were interested in determining which of the two versions the class found more helpful and therefore we asked the following question:

> I would prefer using a diagnostic simulation which would give me immediate feedback. OR I would prefer using a diagnostic simulation which would allow for class discussion.

This was not used as part of the attitude scale discussed above but was a general interest question. The results were as follows:

	PRE-TEST			POST-TEST		
	Indiv.	No Opinion	Group	Indiv.	No Opinion	Group
Composite	10.5	5.3	84.2	15.8	-	84.2
Diag	7.7	7.7	84.6	15.4	-	84.6
No Diag	16.7	-	83.0	16.7	-	83.0

We therefore conclude that most students preferred the batch version of the simulation, where diagnostic information was not received until the following class period. From the results we also find that the shift in opinion to the version which gives immediate feedback can be attributed to the group of students who have had diagnostic experience.

Costs

Computer costs for running the interactive simulations are proving to be quite inexpensive, making the use of these simulations quite practical. The following costs in running the programs were encountered at Northwestern's Vogelback Computer Center.

	Total	Average cost per student
Batch Processing		
Program CREATE	$1.05	
Program SIMCASE (Decision 1) - 5 Teams 25 Students	1.17	$.05
Program SIMCASE (Decision 2) - 5 Teams 25 Students	1.00	.04
Program DIAGNOS (Decision 3) - 5 Teams 25 Students	1.00	.04
Program TEACH (Decision 4) -22 Students	1.61	.07
Shared-Time: Diagnostic Simulation (ON-LINE)		
2½ Hours of Real Time 2 Teams - 7 Students	1.41	.20

Interactive Computer Simulation

1. Evaluation of the Simulation of a Diagnostic Clinic.

To evaluate the diagnostic simulation, a group of practicing and certified learning disabilities specialists was asked to spend a day going through the various parts of the diagnostic simulation of the diagnosing process to evaluate feasibility, practicality, and realism as a training technique. In addition to the diagnosis simulation, they participated in several other computer-learning disabilities activities during the day.

The evaluation session was held on Saturday, December 11, 1971 at the Vogelback Computer Center of Northwestern University. The schedule of activities for the evaluation sessions is shown below.

Schedule of Activities for Evaluation Session.

9:30-10:15 a.m.	Orientation: Janet Lerner Decision 1. Making diagnostic decisions for simulated morning clinic session.
10:15-10:45 a.m.	Computer Uses in Learning Disabilities: James A. Schuyler
10:45-11:30 a.m.	Decision 2. Making diagnostic decisions for simulated afternoon clinic session.
11:30-12:00 noon	C.A.I. Time-sharing Computer-Assisted-Instruction Program. Using PHONICS for teachers.
12:00-12:45 p.m.	Decision 3. Formulating the diagnosis.
12:45-1:30 p.m.	Lunch. Interim evaluation.
1:30-2:15 p.m.	Discussion of the diagnostic decisions of the various teams. Decision 4. Selection of teaching techniques.
2:15-3:00 p.m.	ON-LINE interaction Computer simulation of diagnosis process. Using time-sharing terminal.
3:00-3:30 p.m.	Final Evaluation.

Description of the Evaluators

The public schools of Des Plaines, Illinois, agreed to participate in the evaluation activity. The Des Plaines school district is a large district located northwest of the city of Chicago. This district was selected because it has one of the oldest and best-established learning disabilities programs in the area. The learning disabilities program serves children from kindergarten through high school and learning disabilities teachers in this district come from a variety of backgrounds and many different educational institutions. Six teachers volunteered to act as evaluators. The teachers were randomly divided into two teams.

The following educators participated in the evaluation:

1.	Mrs. Estelle Bradley	Reading/Learning Disabilities Coordinator
2.	Mrs. Rita Deiengonski	Learning Disabilities Teacher
3.	Mr. Harold N. Harrison	Learning Disabilities Teacher
4.	Mrs. Marian S. O'Neil	Learning Disabilities Teacher
5.	Miss Janet G. Pigman	Learning Disabilities Teacher
6.	Mrs. Jo Szcaesney	Learning Disabilities Teacher

The participating evaluators filled out a Data Survey form. The following summary describes the background of the six evaluators.

Certification	Number
Certification in Learning Disabilities State of Illinois	6
Elementary K-9 (Illinois)	4
Elementary K-12 (Illinois)	2
Supervisory (K-14)	1
Adult Education	1

Experience

Number of years in regular education
Range: 0 - 25 Average: 8

Number of years in special education
Range: 1 - 16 Average: 6

Graduate Education

Range: From some graduate work to Ph.D. candidate.
Graduate education received at 5 different colleges and universities.

Areas of training.

The evaluators were asked to specify areas of intensive training. The following areas were indicated.

Area of Intensive Training	Number
Learning Disabilities	6
Elementary education	6
Reading	4
Special education	4
Psychology	2
Counseling	2
Motor development	2
Language and Speech pathology	1
Arithmetic	1
Neurology	1
Early Childhood	1
Secondary education	1

In addition, the evaluators were asked to rank their own areas of interest and strength from a list of 12 areas. The following selections were made:

Areas of Strength

Highest Ranking	Number of evaluators Selecting it
Reading	3
Learning Disabilities	1
Special Education	1
Early Childhood	1
Second Highest Rank	
Learning Disabilities	2
Special Education	1
Arithmetic	1
Elementary Education	1
Reading	1
Third Highest Rank	
Special Education	1
Reading	1
Psychology	1
Early Childhood	1
Neurology	1
Secondary Education	1

CHART A

TEACHER EVALUATION
of Simulated Diagnosis Session

We would like to obtain your opinions concerning the Interactive Computer Diagnosis sessions. Please rate the following questions. We would appreciate any additional comments and suggestions you might have.

1. How would you judge this method as one technique, among others, to teach the process of diagnosing learning disabilities — poor ... excellent
   a. for college students in learning disabilities programs? . . . . 1__ 2__ 3__ 4__ 5__ 6__ 7__
   b. for learning disabilities teachers as part of an "in-service" course.?. . . . . 1__ 2__ 3__ 4__ 5__ 6__ 7__

Comments ______________________________

2. How likely do you think the type of case you worked with would be among children in a typical learning disabilities program? — very likely ... very unlikely
   1__ 2__ 3__ 4__ 5__ 6__ 7__

Comments ______________________________

3. How would you judge this technique as a simulation method for exposing students to group interactions in professional staffings? . . . . — poor ... excellent
   1__ 2__ 3__ 4__ 5__ 6__ 7__

Comments ______________________________

4. Do you think that it would be of value and interest for other learning disabilities specialists to spend a day similar to today's session? . . . . — no value ... very valuable
   1__ 2__ 3__ 4__ 5__ 6__ 7__

Comments ______________________________

5. Do you think it would be valuable for students to work through another diagnostic case on an individual basis, using the ON-LINE terminal?............................ — no value ... very valuable
   1__ 2__ 3__ 4__ 5__ 6__ 7___

Comments ______________________________

6. Do you think that working through a case would be a fair examination for students in a Diagnosis course?............. — yes ... no
   1__ 2__ 3__ 4__ 5__ 6__ 7__

Comments ______________________________

7. Would you be interested in learning more about the computer and learning disabilities? — yes ... no
   1__ 2__ 3__ 4__ 5__ 6__ 7__

Comments ______________________________

Overall comments, suggestions, criticisms ______________________________

use other side, if you wish

Evaluation Summary

Several different evaluation approaches were used. 1) An evaluation instrument was designed using a Likert-type scale. Each participant completed the form (See chart A on following page). 2) The decision-making sessions, as well as the evaluation session, were taped. 3) Detailed notes were taken during the oral evaluation session. These will be summarized below.

Summary of Teacher Evaluation of Simulated Diagnosis

Question 1.

How would you judge this method as one technique among others to teach the process of diagnosing learning disabilities?

a. for college students in learning disabilities programs?

b. for learning disabilities teachers as part of the "in-service" course?

Rating scale: 1 through 7 (poor-1-through excellent-7).

Ratings of Evaluations		Number
Part a.	Rating 7	5
	Rating 6	1
	Average Rating 6.8	
Part b.	Rating 7	5
	Rating 6	1
	Average Rating 6.8	

Question 2.

How likely do you think the type of case you worked with would be among children in a typical learning disabilities program?

Rating scale: 1 through 7 (very likely-1 through very unlikely-7).

Ratings of Evaluations	Number
Rating 1	4
Rating 2	1
Rating 3	1
Average rating 1.5	

Question 3.

How would you judge this technique as a simulation method for exposing students to group interactions in professional staffings?

Rating scale: 1 through 7 (poor-1 through excellent-7)

Ratings of Evaluations	Number
Rating 7	2
Rating 6	3
Rating 5	1
Average rating 6.2	

Question 4.

Do you think that it would be of value and interest for other learning disabilities specialists to spend a day similar to today's sessions?

Rating scale: 1 through 7 (no value-1 through very valuable-7).

Ratings of Evaluations	Number
Rating 7	5
Rating 6	1

Average rating 6.8

Question 5.

Do you think it would be valuable for students to work through another diagnostic case on an individual basis, using the ON-LINE terminal?

Rating scale: 1 through 7 (no value-1 through very valuable-7).

Ratings of Evaluations	Number
Rating 7	5
Rating 6	1

Average rating 6.8

Question 6.

Do you think that working through a case would be a fair examination for students in a Diagnosis course?

Rating scale: 1 through 7 (yes-1 through no-7).

Ratings of Evaluations	Number
Rating 1	4
Rating 2	1
Rating 5	1

Average rating 1.8

Question 7.

Would you be interested in learning more about the computer and learning disabilities?

Rating scale: 1 through 7 (yes-1 through no-7).

Ratings of Evaluations	Number
Rating 1	6

Average rating 1

Evaluation of the Course

The specific objectives of the introductory computer course as set down by the Special Projects Application Proposal made in August, 1972 are:

1. To develop an awareness and appreciation among students of what is happening to computer technology and in this way to develop an open attitude toward computers and their uses.

2. To develop the ability to clearly analyze problems and reduce them to a form easily handled by the computer.

Therefore with the introduction of this course in January, 1973, it was necessary to develop a method of evaluating it in terms of these specific objectives. To evaluate the computer course in terms of the first objective, an attitude questionnaire with multi-level responses was constructed. The scale used a polar choice format, where each question aas a choice between two statements, dealing with the same content, but with one that advocated the pro position and the other the con. This required the student to locate his attitude on a scale anchored by a statement at each pole. The question is shown on the following page.

The questionnaire was administered twice. It was given to all the students who were enrolled in the course on the first day of class to measure theclass attitudes before taking the course and the same questionnaire was again given on the last day of class to measure class attitudes at the end of the course. By studying both the pre and post tests results, we were able to effectively evaluate attitude change.

Various statistical procedures wer used to insure that the scale was meaningful and that it represented a reliable instrument. The Modified Language Input (MLI) was used to measure the internal consistency reliability of the scale. MLI was developed at Northwestern with the assistance of Dr. Phillip Freidman. This program computes a HOYTR as a measure of reliability and calculated a .7097 figure as a measure of the internal consistency of the questionnaire that was used in this analysis. This figure indicates reasonable reliability of an instrument that measure attitudes. Using the reciprocal averages technique a reliability of .8463 was computed. The new weightings computed by the reciprocal averages technique, should be used for all future administrations of this attitude scale.

To analyze changes of attitude as measured by the entire instrument, the alternatives of each question were weighted. The most desirable or what was considered the "ideal response" was weighted 5 and the least desirable response was given a weight of 1. A total score was then computed for each student for both the pre and post-tests and using these scores a statistical analysis was performed to determine whether attitudes had in fact changed.

[illegible]

Class: Undergraduate___ Graduate___ Special___
Major: L.D.___ Speech___ Hearing Impaired___ Audiology___
Education___ Other (specify)___

Have you had any computer experience? None___ A computer course___ Familiar___

Each item consists of two alternatives, A and B, between which you are asked to choose by circling one of these indicators:

- A - Statement A is entirely preferred to Statement B as an expression of my opinion
- a - Statement A is somewhat preferred over Statement B
- ? - I cannot choose between A and B
- b - Statement B is somewhat preferred to Statement A
- B - Statement B is entirely preferred to Statement A as an expression of my opinion

A a ? b B 1. A. I would not be hesitant to use the computer in my research studies or in my job. (54321)

B. I would be hesitant to use the computer in my research studies or in my job.

A a ? b B 2. A. I would feel hesitant in asking a computer consultant for assistance in solving a problem. (11245)

B. I would not be hesitant in asking a computer consultant for assistance in solving a problem.

A a ? b B 3. A. I do feel that the computer has a good use in the field of learning disabilities and in related fields. (54321)

B. I do not feel that the computer has a good use in the field of learning disabilities and in related fields.

A a ? b B 4. A. I have some ideas of how the computer can be used by people in the field of learning disabilities and in related fields. (54321)

B. I have no idea of how one would use the computer in the field of learning disabilities and in related fields.

A a ? b B 5. A. I would prefer to analyze my statistical data using a computer program. (54321)

B. I would prefer to analyze my statistical data using a calculator.

A a ? b B 6. A. If I were to use a computer, I would only use one which is similar to the one found at the Northwestern Computing Center. (12345)

B. If I were to use a computer, I would not be concerned with the type of computer I was using.

A a ? b B 7. A. If asked, I would not be afraid to get involved in assisting in the development of computer applications relating to my field of interest. (54321)

B. If asked, I would be afraid to get involved in assisting in the development of computer applications relating to my field of interest.

A a ? b B 8. A. Only those who have a mathematical talent should get involved in the study of computers. (12345)

B. Anybody with an interest in computer uses should get involved in studying its technology.

A a ? b B 9. A. I feel that computer experts are eager to assist those who are inexperienced. (54321)

B. I feel that computer experts do not enjoy assisting those who are inexperienced.

A a ? b B 10. A. I feel that one must be a computer specialist to plan computer applications in a field such as learning disabilities. (12345)

B. I feel that someone who merely has a basic understanding of the capabilities of the computer can plan computer applications in a field such as learning disabilities.

A a ? b B 11. A. I would be hesitant to enter a department which required that I take a general computer course. (12345)

B. I would not be hesitant to enter a department which required that I take a general computer course.

A a ? b B 12. A. I feel that a simple error in my program could cause a computer failure. (12345)

B. I feel that no error in my program could cause a computer failure.

A a ? b B 13. A. I would consider dropping a course which required me to use the computer to solve my homework assignments. (12345)

B. I would not consider dropping a course which required me to use the computer to solve my homework assignments.

A a ? b B 14. A. I would consider a job with an organization which makes extensive use of the computer as an aid to diagnosis and remediation. (54321)

B. I would not consider a job with an organization which makes extensive use of the computer as an aid to diagnosis and remediation.

A a ? b B 15. A. I would consider keypunching my own research data. (54345)

B. I would never consider keypunching my own research data.

Statistical Study

NULL HYPOTHESIS: The students enrolled in the Computer Course exhibit no significant change in their attitudes toward computers after completing the course.

STATISTICAL TEST:

Since each student was given both the pre and post test, it is safe to assume that their scores may be correlated and it is for this reason that a correlated t test was used for the analysis.

SIGNIFICANCE LEVEL

A .05 level was chosen as the probability level for rejecting the null hypothesis. The analysis was performed on 15 cases, although there were more students enrolled in the class. We did not have both pre and post test scores on the other students.

RESULTS

Using the Statisitical Package for the Social Sciences (SPSS) T-test subprogram developed at Northwestern, it was found that there was a significant change in attitude in the positive direction or in the direction of "desired response" at the .001 level. We feel from these results therefore that the introductory computer course did contribute to encouraging an open attitude toward computers and therefore that we have met the first objective as set down in the Special Projects Application. We do however, realize all the limitations of such an interpretation. We know that in this kind of design, one group pre-post test, that there are many factors such as history (events other than the class presentation which encouraged changes in attitude) and the effect of the instrument itself (the fact that the answers might simply reflect what the class felt was expected and not a true expression of opinion) which effect the internal validity of such an analysis. However, we feel that this was the best method of objectively studying attitude change that we had available.

Variable	# of Cases	Mean	SD	SE	Corr	2-Tail Prob	Mean Diff	SD	SE
Pre-Test	15	56.5333	8.331	2.151	.570	.027	-8.6	6.998	1.807
Post-Test	15	65.1333	6.198	1.60					

T-Value	DF	2-Tail Prob
-4.76	14	.001

By using both the output from the MLI program and from the cross tabulation option of SPSS, we were able to study each question of the scale individually and assess attitude changes not only as measured by the entire instrument but also by specific questions. In the Table below, we have presented in tabular form the percentages of positive and negative responses on each question both on the pre and post tests. Positive attitudes are defined as those in the direction

TABLE 3

RESULTS OF COMPUTER ATTITUDE QUESTIONNAIRE ADMINISTERED TO THE STUDENTS OF C07

QUESTION	PRE-TEST				POST-TEST				CHANGE IN POSITIVE ATTITUDE
	Positive			Negative	Positive			Negative	
	Entirely Prefer	Somewhat Prefer	Total Positive	Total Negative & No Opin	Entirely Prefer	Somewhat Prefer	Total Positive	Total Negative & No Opin	
1	26.7%	33.3%	60.0%	40.0%	86.7%	13.3%	100%	-	40.0%
2	53.3	20.0	73.3	26.7	53.3	6.7	60.0	40.0	13.3
3	66.7	13.3	80.0	20.0	80.0	20.0	100	-	20.0
4	13.3	66.7	80.0	20.0	93.3	6.7	100	-	20.0
5	53.3	33.3	86.6	13.4	93.3	6.7	100	-	13.4
6	13.3	40.0	53.3	46.7	13.3	53.3	66.3	33.3	13
7	33.3	26.7	60.0	40.0	53.3	33.3	86.7	13.3	26.7
8	40.0	33.3	73.3	26.7	53.3	46.7	100	-	26.7
9	20.0	13.3	33.3	66.7	20.0	33.3	53.3	46.7	20.0
10	6.7	53.3	60.0	40.0	40.0	60.0	100	-	40.0
11	60.0	40.0	100	-	100	-	100	-	-
12	0	14.3	14.3	85.7	28.6	21.4	50	50	35.7
13	46.7	40.0	86.7	13.3	86.7	6.7	93.3	6.7	6.6
14	26.7	53.3	80.0	20.0	60.0	33.3	93.3	6.7	13.3
15	26.7	66.7	93.3	6.7	46.7	53.3	100	-	6.7

of the "ideal response" while the negative attitudes are defined as those responses of no opinion or with an opinion in the opposite direction of the "ideal response". It is obvious from looking at the table that attitudes are primarily in the positive direction even on the pre test. This was expected as the course was not a required one and therefore only those students with essentially a positive attitude toward the study of computer technology would consider enrolling in it. We further discovered from our analysis that questions one and thirteen are the most reliable, each of which had a reliability figure greater than .70. As measured by the Fisher's Exact Test, there was no individual question where there was a significant change of attitude at the .05 level from pre to post test. It should also be noted that only in question two was there a shift to a less desirable response from pre to post test. This will be discussed further below.

Looking at each question in terms of the "ideal response" we find:

QUESTION I
"Ideal Response"
I would not be hesitant to use the computer in my research studies or in my job.

In the past students in the department of Learning Disabilities have not extensively used the statistical computer programs available at Northwestern to analyze their data. Where the data required simple calculations, they performed the analysis by hand or on an electronic calculator. Often they would hire computer consultants to perform analyses which required complex calculations and they rarely even considered such techniques as factor analysis which are best performed on the computer. We hoped that after completing the introductory course that we would find that our students would look forward to doing their own computer work and that in this way they would be encouraged to use some of the more complex statistical techniques which are best performed on the computer. We found that from pre to post test 40% of the students enrolled in the computer course changed from a negative position on this question to a positive one and that after the course the entire class felt that they would be willing to use the computer in their research or on the job.

QUESTION 2
"Ideal Response"
I would not be hesitant in asking a computer consultant for assistance in solving a problem.

We were hoping that by asking the students in the class to run their jobs at Northwestern's Computing Center, that they would become more familiar with its facilities and with the professional assistance one can obtain there. By looking at the attitude's expressed in this question, where there was a shift to negative opinions, we can only assume that some of our students had unpleasant experiences while working their assignments. The result on this question seems, however, to contradict those found on question 9 which has a similar underlying concept, the request for assistance. We can only assume that the terms computer consultant and computer expert are important to the opinions expressed

in these questions. We should note that the computer consultants at the computing center are students themselves and that they might not be as willing to help as those who consult in other environments.

QUESTION 3
"Ideal Response"

I do feel that the computer has a good use in the field of learning disabilities and in related fields.

A considerable portion of course was devoted to discussing the ways in which the computer can be used in other than scientific fields. For instance, the students were shown how the computer can be used as a tool in diagnosis or how computer simulations can be used effectively as an aid in instruction. It would appear from the results that we successfully exposed the class to various computer applications for the entire class felt positively with regard to this question after completing the course.

QUESTION 4
"Ideal Response"

I have some ideas of how the computer can be used by people in the field of learning disabilities and in related fields.

The comments regarding question three also apply here and the fact that 100% of the class also felt positively on the post test on this question further supports the interpretation we presented above.

QUESTION 5
"Ideal Response"

I would prefer to analyze my statistical data using a computer program.

During the course we not only assigned computer programs which were to be written by the student himself but we also required that he run some package statistical programs such as SPSS so that he might see how easy it is to analyze his data by computer. After completing the course we found that 100% of the class felt that they preferred using the computer to using a calculator for statistical analysis. This further supports our interpretation of question 1.

QUESTION 6
"Ideal Response"

If I were to use a computer, I would not be concerned with the type of computer I was using.

We wanted to direct the class discussions to computers in general and not specifically to the CDC 6400 that is used by the students at Northwestern.

We were interested in teaching the students that all computers are easy to use and that similar packages are available on all computers.

Although there was a slight shift in attitude in the positive direction, the shift was not as great as we would have liked. 33.3% of the class still preferred using a CDC 6400. We were happy to see, however, that only one person actually said that he would only use a CDC 6400.

QUESTION 7
"Ideal Response"

If asked I would not be afraid to get involved in assisting in the development of computer applications relating to my field of interest.

It is important when developing computer application that one have both a computer expert and a subject matter expert working on the development and implementation. It would be ideal if one person had both capabilities, however, most often this is not the case. We hoped that through class discussion we would encourage more of our students to get involved in application development and implementation. After completing the course, 86.9% of the class felt that they would be willing to assist in the development of computer applications which is a significant change from the opinions expressed on the pre test where only 60% expressed positive opinions.

QUESTION 8
"Ideal Response"

Anybody with an interest in computer uses should get involved in studying its technology.

We wanted to dispell the myth that only individuals with a special talent for mathematics can be successful in computer studies. We wanted the class to learn there are various levels at which one can study computer technology and that one need not possess any real talents to study computer technology at the basic level. He need only have an interest in doing so. We found that entire class expressed the opinion that interest is enough.

QUESTION 9
"Ideal Response"

feel that computer experts are eager to assist those who are inexperienced.

The comments made regarding question two apply to this question also. t would appear from the responses to these two questions that on the whole the class members are still not generally eager to request assistance from computer professionals.

QUESTION 10

"Ideal Response"

I feel that someone who merely has a basic understanding of the capabilities of the computer can plan computer applications in a field such as learning disabilities.

The underlying concept of this question is similar to that found in question seven, that subject matter experts should not be afraid in getting involved in developing computer applications and that development does not necessarily mean that one must have the technical expertise needed for implementation. There was a great shift in opinion from pre to post test on this question. On the post test, the entire class felt that one need only have a basic understanding to plan computer applications while only 60% of the class expressed this opinion on the pre test. It would appear from the results on question seven and ten that we were successful in encouraging the members of the class to get involved in computer applications.

QUESTION 11

"Ideal Response"

I would not be hesistant to enter a department which required that I take a general computer course.

In general we assumed that even on the pre test the members of the class would answer this question in the positive direction. This was indeed the case with 100% of the class expressing positive opinions on the pre test. It is interesting to note, however, that of this 100% only 60% were entirely certain that they would enter a department which had a curriculum that required their students to take a general computer course while of the 100% which answered positively on the post test, all 100% were entirely certain. We feel that this indicates that we were successful in developing a course which presented material at the appropriate technological level.

QUESTION 12

"Ideal Response"

I feel that no error in my program could cause a computer failure.

We were interested in teaching the class about both the interdependence and the independence of the computer operating system and the computer programs written by the student. Most beginning programmers feel that through their programs that they can direct the operation of the computer that errors in their programs can in fact even cause computer failures. The general inexperience of the class is reflected by the opinions expressed by them on the pre test. More of the class expressed negative opinions on the pre-test on this question than on any other on this attitude questionnaire. By the end of the quarter we were able to change the opinion of 35.7% of the class.

QUESTION 13

"Ideal Response"

I would not consider dropping a course which required me to use the computer to solve my homework assignments.

The underlying concept expressed in this question is similar to that expressed in question 11, that the student should not fear studying the computer as part of their academic program. 93.3% of the class felt positively on the post test and there was a shift from pre to post test of 40% from prefer to entirely prefer.

QUESTION 14

"Ideal Response"

I would consider a job with an organization which makes extensive use of the computer as an aid to diagnosis and remediation.

We feel that with the technological revolution created by the computer, a Learning Disabilities Specialist, more than ever before is likely to find himself applying for positions in hospital clinics and other agencies which make use of the computer. Our department is interested in preparing our graduates both psychologically and academically, to accept positions in such institutions. We found that 93.3% of the class would consider such a position and that there was a 33.3% shift to the entirely preferred opinion from pre to post test.

QUESTION 15

"Ideal Response"

I would consider keypunching my own research data.

We tried to show the class that keypunching was no more difficult than typing and it appears that we were successful and that the class did not find keypunching difficult, for they all felt that they would consider keypunching their own research data.

To further study class opinion, we asked the members to comment on the open-ended question, "What was your overall reaction to the introductory computer course?" Here are some of the comments that we received. In general, the members of the class felt that the course was worthwhile and a valuable learning experience. It would appear from the comments that the students were particularly interested in programming and computer applications and less interested in learning about computer hardware.

To evaluate the computer course in terms of the second objective (to develop the ability to clearly analyze problems and reduce them to a form easily handled by the computer) we are including some of the computer problems designed by members of the class and also some of the projects that they actually completed.

The class was divided into two groups, those who were interested in learning FORTRAN and those who had personal computer projects they wanted to

complete. The class met as a whole two days a week and was divided into these two groups for the remaining class meeting. Those students who chose to learn FORTRAN were required to complete three FORTRAN programming problems and to design a problem which they felt could effectively be solved by computer, either using FORTRAN or some other computer language. Everyone was able to complete the assignments with minimum assistance. The actual assignments and example solutions as completed by the class members are included below. Also included below are three of the original problems designed by the members of the class. The problems relate to the fields of Learning Disabilities, Speech Pathology and Audiology.

COURSE EVALUATIONS

I generally feel that the course was a worthwhile one, especially considering the experimental nature of the course. I do, however, have some suggestions which might serve to make the course better (at least for someone like me) if it is taught again.

First of all, I would have liked to do more work with SPSS and Basic. I feel that my knowledge of these areas is far from complete. Perhaps less time could have been spent talking about the mechanics of the computer system itself, (something we rarely come into contact with) and more time spent in discussing the capabilities of SPSS and Basic.

The same is generally true of FORTRAN, but I realize that seldom does one (even complete) course furnish the perspective programmer with all the tools of this language.

I guess what I'm trying to say is that yes, I have a general understanding of these three systems but don't feel entirely competent in any. Perhaps this is all I need, though, for my present work and for my later research.

I enjoyed the informal nature of the class and the class participation. Also, I enjoyed my contact with the computer (even when it didn't run my programs the way I would have liked) and feel much more confident about my "analytical" abilities.

Having known relatively nothing at the beginning of the course, I can now safely say I have learned something, in fact I must boastfully say "a great deal."

Now for a consideration of the course itself. Overall the course began at a great pace. I think proper consideration was given to those of us who knew nothing and I really mean this, it was important that we not be scared away . . . . which we weren't.

The lectures and assignments for <u>basic</u> language were good, and the decision to use the basic first was a good one. It "warmed" us up to the confrontation of SPSS.

I wish more demonstration of programming would have taken place. That is, more of a lab atmosphere within the class. Perhaps once a week one session could be devoted to presenting a problem to be solved by the group in the language being studied at that time. A few on-line terminals could be available.

I thought the weekly group meetings were excellent. I personally learned a great deal about FORTRAN and it was because the FORTRAN lectures were relevant to programming problems. There was a freedom to make a "fool" of oneself if a question was a bit elementary.

Frankly, the last third of the course was weakest. I would have preferred discussing and analyzing problems and their interpretation into language than be exposed to "national digital analogue programs". Hence the lectures toward the end faded. Cest la vie!! More practice in class would have been helpful.

First, I improved 200% in my understanding of programming. I also was happy that I was given the opportunity to program. This, to me, was the most

valuable portion of the course. Further, the workbooks were excellent.

My criticisms would include the following:

1. The last weeks of the course dealt with subjects that I had little interest in. This would include discussion of computers in the U.S.A.

2. More specific work was needed on the section of SPSS.

3. Other library programs, including some introduction to the BMD system should have been included.

4. It appeared that the objectives of the course and a clear course outline had not been clearly formulated at the beginning of the quarter. While I understand that this is the first year for this course and further, while I am not opposed to courses with flexibility, it seemed that assignments were thought up, or altered at the spur of the moment. This was not fair to the students.

The course was useful in giving us exposure to several languages and in allowing us to try out various ideas. Before this course I had not given much serious thought to using the computer in C.D. The two fields seemed as far apart as possible. However, the course made me see that not only are computers relevant in many subfields, but in a few years they will be relevant in everything we do. Discussions of other computers, incompatibility, and the like served to show how widespread computer technology is. I now feel that a new level of "literacy" is required - that of being literate on a computer.

The course was not relevant to the program if all you read was the desription. This is a real drawback. If people only knew how important this area is !!! When I view research being done by the "unenlightened" I feel like I have travelled back in time. (See last paragraph below)

No fault could possibly be found with course organization. It was very well organized and taught.

If somehow we could make this course NECESSARY for all doctoral students (at least) it would be a great thing. If some, even devious, way could be found to make computer "literacy" a requirement, this course would get a real boost. It would well become the most taken course in the Speech School.

This was the most refreshing course I've had in years. Perhaps its the change of pace from heavy reading, but the organization and lectures certainly added to my enjoyment. Frankly, the content was more than I expected. I really think that we covered a lot of ground and amazingly, were able to become relatively proficient in several techniques. I really feel very comfortable about using the computer now. Yes, Connie, the flow charts should precede the programming.

I think this was worthwhile experience and I tend to be a skeptic . . . All in all it was a good experiment.

This course really shouldn't have been Computer Applications in Com Dis but just programming I.

I felt that the course was well organized and well taught. I would have liked to have gone into BASIC in a little more detail. I felt that someone was always willing to help me with a problem on my project or to provide

sources of information for further interest on a topic. I felt that I learned quite a bit in the course, although I thought that having a background in FORTRAN made certain aspects of the course boring. I was glad of the additional exposure to computers and programs as it made me less frightened of them. On the whole, I thought the course was <u>very</u> good.

I feel the course offered a variety of bits and pieces from several areas related to computers. That is, we learned some programming, some information about the computer system and something about how computers can be of practical use.

Personally, I hadn't expected much programming to be taught and would have preferred a greater emphasis on CAI and computer applications. However, the way the class was handled left a great opportunity for the student to enlarge upon the area he was interested in - which is good - and with such a variety of interests and backgrounds, necessary!!

This was a valuable learning experience. In terms of the outline of the course, I would have liked to have covered some other languages in the formal class setting. I felt that I really learned a lot from the course. When I entered the class I knew nothing about computers or computer programming. Now I feel I have a basic understanding of how I could utilize a computer service in research. In terms of instructional techniques, I felt that the section of how a computer operates could have been explained in a clearer manner. I really enjoyed this course.

The class seemed to be at first disorganized, at first - who was to what, when, how --- after some initial trial and errors things though picked up - considerably. I would have liked to see more demonstrations, use of audio visual materials to explain content, i.e. slides, overhead, etc.

I liked the idea of individualization, and individual projects. I would have liked to have had more time for individual needs in solving problems, lab sessions.

The instructors were positive and enthusiastic in their approach and they knew what they were talking about - especially Jim, I liked having special speakers on various topics.

I was/am a little vague on evaluation (grades).

I learned a lot. I knew nothing when I came to the class about computers. The class was beneficial to future research.

I think the course was very interesting, and useful. I particularly appreciated the fact that it involved both an introduction to programming in more than one language as well as general background regarding computer software and hardware.

I considered the instruction to be very adequate. And I felt that I benefited greatly. The course did very definitely accomplish the goal of introducing the wide variety of opportunities for computer applications.

I took the course for the purpose of doing some kind of project on my own. I learned three new languages, I began to feel comfortable with on-line processing and I did a project which I believed was valuable. I learned much from doing my project and enjoyed doing it.

My expectation of this course was that I would learn different ways of applying the computer to Com Dis. and that I would try some unique application myself. My expectations were met.

That's how the course applied to me. Trying to be objective, I think that there was enough programming, there was a wide variety of options which compliment the wide variety of backgrounds of the class.

I found the course to be challenging, as I had previously had no computer experience. I am leaving the course with a knowledge of where to look in order to apply computer to problems. I found the workbooks to be quite helpful in explaining procedures. I feel more confident in programming, although in the case of FORTRAN I find that I rely heavily on referencing, in the workbook each step along the development of the program. I would have been interested in doing more work with SPSS than what was talked about during class time.

I feel now both a need and desire to study computer applications further.

Excellent course - I feel the varied interests and computer experience of the class members was handled well by interest groups. I would have liked having a little more experience with SPSS as well as FORTRAN, and perhaps use of BASIC by interest only. Project reports were helpful.

Programming experience was valuable.

Generally I feel I learned quite a bit, and do not dread using the computer for my dissertation as I had prior to the course.

My only complaint was with the few lectures on the computer availabilities, I thought they might have been condensed into fewer lectures allowing more class sessions for lab.

One other suggestion is to have computer terminals available on Saturday, and evenings for those of us with scheduling problems.

I believe that you should state that some knowledge of statistics would be helpful. I also believe some suggested readings should have been offered. No matter what my letter of evaluation of work done in this course, I know that I have learned a great deal - most important to me is on improvement in my ability to think through a problem step by step.

I received more than my share of assistance from everyone. I enjoyed putting myself through the wringer of hard work.

I enjoyed getting the programming information of BASIC, FORTRAN, Tutor, as well as SPSS and the on-line experience. I feel the handouts on the programming methods were good.

I feel the major question is how important to us was the last few weeks of class. In doing a project in Tutor I missed the experience with the FORTRAN labs. I feel I would have liked to have gotten both. The information covered in the last few weeks I don't find too helpful.

I would have liked more in-depth study in FORTRAN or BASIC or SPSS and done more programming for experience.

Supplementary Information (appendices)

CONTENTS

DIAGNOSTIC INFORMATION AVAILABLE   Sally Simcase

1. Wechsler Intelligence Scale for Children.(entire.test). . . . . . . 60 minutes
2. WISC Information
3. WISC Similarities
4. WISC Comprehension
5. WISC Arithmetic
6. WISC Vocabularly
7. WISC Digit Span
8. WISC Picture Completion
9. WISC Picture Arrnagment
10. WISC Block Design
11. WISC Object Assembly
12. WISC Coding
13. WISC Mazes
14. Stanford-Binet Intelligence Scale. . . . . 60 minutes
15. Illinois Test of Psycholinguistic Abilities (entire test). . . 90 minutes
16. ITPA Auditory Reception
17. ITPA Visual Reception
18. ITPA Visual Association
19. ITPA Verbal Expression
20. ITPA Manual Expression
21. ITPA Grmmatic Closure
22. ITPA Visual Closure
23. ITPA Auditory Sequential Memory
24. ITPA Visual Sequential Memory
25. ITPA Auditory Closure
26. ITPA Sound Blending
27. ITPA Auditory Association
28. Detroit Tests of Learning Aptitude.(entire.test). . . . . 144 minutes
29. DTLA Pictorial Absurdities
30. DTLA Verbal Absurdities
31. DTLA Pictorial Opposites
32. DTLA Verbal Opposites
33. DTLA Motor Speed
34. DTLA Auditory Attention Span for Unrelated Words
35. DTLA Oral Commissions
36. DTLA Visual Attention Span for Objects
37. DTLA Orientation
38. DTLA Free Association
39. DTLA Designs
40. DTLA Auditory Attention Span for Related Syllables
41. DTLA Number Ability
42. DTLA Social Adjustment
43. DTLA Visual Attention Span for Letters
44. DTLA Disarranged Pictures
45. DTLA Oral Directions
46. DTLA likenesses and Differences

47. Frostig Developmental Test of Visual Perception (entire test). . .25 minutes
48. Frostig Eye-motor Coordination
49. Frostig Figure-ground Perception
50. Frostig Form Constancy
51. Frostig Position in Space
52. Frostig Spatial Relationships

53. Beery-Butenica Developmental Test of Visual-Motor Integration . .20 minutes

54. Goodenough-Harris Draw-A-Man Test. . . . . 10 minutes

55. Heath Railwalking Test. . . . . 15 minutes

56. Purdue Perceptual Motor Survey Test. . (entire test). . . . . . . 55 minutes
57. Purdue Walking Board
58. Purdue Jumping
59. Purdue Identification of Body Parts
60. Purdue Obstacle Course
61. Purdue Kraus-Weber
62. Purdue Angels-in=the-snow
63. Purdue Chalkboard
64. Purdue Rhythmic Writing
65. Purdue Ocular Pursuits
66. Purdue Visual Achievement
67. Purdue Imitation of Movement

68. Picture Store Language Test. 20 minutes
PSLT Productivity--Total Words
PSLT Productivity - Words per Sentence
PSLT Productivity - Total Sentences
PSLT Syntax Quotient
PSLT Abstract-Concrete Scale

74. Peabody Picture Vocabulary Test. . . . . 15 minutes

75. Templin-Darley Test of Articulation. . . . . 15 minutes

76. Wide-Range Achievement Tests. . . . . . .(entire test). . . . . . 30 minutes
77. WRAT Spelling
78. WRAT Arithmetic
79. WRAT Reading

80. Vineland Social Maturity Scale. . . . . 5 minutes

81. Gates-Russell Spelling Diagnostic Tests (entire test) . . . . . . 60 minutes
82. Gates-Russell: Spelling Words Orally
83. Gates-Russell: Word Pronunciation
84. Gates-Russell: Giving Letter for Letter Sound
85. Gates-Russell: Spelling one-syllable
86. Gates-Russell: Spelling two-syllable
87. Gates-Russell: Word Reversals
88. Gates-Russell: Spelling Attack
89. Gates-Russell: Auditory Discrimination
90. Gates-Russell: Visual-Auditory-Kinesthetic

92. Gates-McKillop Reading Diagnostic Tests. . .(entire.test). . . . 55 minutes
93. Gates-McKillop Oral Reading
94. Gates-McKillop Words - Flashed Presentation
95. Gates-McKillop Words - Untimed Presentation
96. Gates-McKillop Phrases - Flashed Presentation
97. Gates-McKillop Knowledge of Word Parts
98. Gates-McKillop Letter Sounds
99. Gates-McKillop Letter Names
100. Gates-McKillop Recognizing Visual Form of Sounds
101. Gates-McKillop Audiotry Blending
102. Gates-McKillop Supplementary Tests

103. Lincoln - Oseretsky Tests. . . . . 15 minutes

104. Gates-MacGinitie Reading Tests (entire test). . . . . 40 minutes
105. Gates-MacGinitie - Vocabulary
106. Gates-MacGinitie - Comprehension

107. Metropolitan Achievement Tests (entire test). . . . . 45 minutes
108. MAT Word Knowledge
110. MAT Reading
111. MAT Arithmetic Concepts and Skills

112. Metropolitan Elementaryb Arithmetic Tests (entire test). . . . . 30 minutes.
113. MEAT Arithmetic Computation
114. MEAT Problem Solving and Arithmetic Concepts

115. Gilmore Oral Reading Test. 10 minutes.

116. Durrell Analysis of Reading Difficulty (entire test) . . . . . . 65 minutes
117. Durrell - Oral Reading
118. Durrell - Silent Reading
119. Durrell - Listening
120. Durrell - Flash
121. Durrell - Word Analysis
122. Durrell - Spelling
123. Durrell - Handwriting
124. Durrell - Naming Letters
125. Durrell - Visual Memory of Words
126. Durrell - Hearing Sounds in Words
127. Durrell - Spelling - Visual Memory
128. Durrell - Spelling - Phonics
129. Durrell - Spelling Test

130. Gray Oral Reading Test . . . . 15 minutes

131. Monroe Reading Aptitude Test. . . . . 25 minutes
132. Monroe - Visual
133. Monroe - Auditory
134. Monroe - Motor
135. Monroe - Articulation
136. Monroe - Language

137. Medical Reports (entire medical battery) . . . . 50 minutes
138. Psychiatric Report (10 minutes)
139. Neurological Report (10 minutes)
140. Ophthalmological Report (10 minutes)
141. EEG Report (10 minutes)

142. Keystone Visual Screening. . . . . 10 minutes

143. Audiometric Screening. . . . . 10 minutes

144. Sequin Form Board. . . . . 5 minutes

145. Knox Cube Test. . . . . 5 minutes

146. Wepman Auditory Discrimination Test. . . . . 5 minutes

147. Dynometer . . . . 2 minutes

148. Language and Speech Report. 15 minutes

149. Bender-Visual-Motor Gestalt Test. . . . . 7 minutes

150. Laterality Preference Test. . . . . 7 minutes

151. Primary Mental Abilities Test (entire test). . . . . 28 minutes
152. PMA Verbal Meanings
153. PMA Spatial Relations
154. PMA Perceptual Speed
155. PMA Number Facility

156. Case History Report. . . . . 5 minutes
157. Behavior Rating Scale. . . . . 10 minutes

158. Informal Reading Inventory. 15 minutes

159. Oral Mechanism Examination. 10 minutes

SIMULATED DIAGNOSIS

Case: SALLY SIMCASE2
C.A.: 8 years 8 months
Grade: 3.1
Reason for Referrall-Reading difficulty in school

This child has been referred to your clinical team for a diagnosis of her problem. Your team will have an entire day for the evaluation. The child will be in the clinic from 9:00 a.m. to 12:00 noon. After an hour lunch break she will retrun to the clinic at 1:00 p.m. and remain until 3:00 p.m.

Your team will meet for a staffing and the making of diagnostic decisions four times: (1) before the child arrives, to make plans for the morning session; (2) during the lunch hour to plan the afternoon session; (3) after the evaluation session to formulate the diagnosis; (4) as individuals at a final session to make decisions concerning appropriate teaching plans for the child who has been diagnosed.

DECISION 1. (pre-staffing)

Each team will estimate the time that each evaluative inscrument will take in planning the morning session. You may give an entire test battery or select to administer subtests. In addition you can obtain information on the case study report, medical reports, speech and language evaluations, teacher rating scales, etc. If you plan for more evaluations that the time allotted, the program will not accept the test and will instead select an alternative recommended test that can be given in the remaining time.

Fill in the form for DECISION 1 at the end of the pre-staffing session.

1. Diagnostic team name (maximum of 8 spaces)

___ ___ ___ ___ ___ ___ ___ ___

2. Members of Diagnostic Team. (maximum of 56 spaces)

____

____

____

3. Assessment information desired in the morning session (plan for three hours). Put down the numbers for the diagnostic information desired.

___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

NORTHWESTERN UNIVERSITY
LEARNING DISABILITIES SIMULATION
DIAGNOSIS PROGRAM

SALLY SIMCASE   8.8 YEARS GRADE 3.1
REASON FOR REFERRAL   READING PROBLEMS IN SCHOOL

NAME OF THE DIAGNOSTIC TEAM   TEAM E
MEMBERS OF THE TEAM ARE   E.BATTLE, C.TOTTEN, M.GIBLICHMAN

THIS IS THE INFORMATION GATHERED IN THE 180 MINUTES OF THE MORNING SESSION

NOTES

• • • PLUS(+) REPRESENTS THE TEST CEILING-THE HIGHEST SCORE OBTAINABLE ON THE TEST LISTED

• • • MINUS(-) REPRESENTS THE BASE LEVEL-THE LOWEST SCORE OBTAINABLE ON THE TEST LISTED

1	WECHSLER INTELLIGENCE SCALE FOR CHILDREN WISC VERBAL 86, WISC PERFORMANCE 118	FULL	102.0
	WISC INFORMATION	SS	7.0
	WISC SIMILARITIES	SS	10.0
	WISC COMPREHENSION	SS	12.0
	WISC ARITHMETIC	SS	8.0
	WISC VOCABULARY	SS	6.0
	WISC DIGIT SPAN	SS	5.0
	WISC PICTURE COMPLETION	SS	10.0
	WISC PICTURE ARRANGEMENT	SS	13.0
	WISC BLOCK DESIGN	SS	15.0
	WISC OBJECT ASSEMBLY	SS	17.0
	WISC CODING	SS	9.0
	WISC MAZES	SS	11.0
54	GOODENOUGH-HARRIS DRAW-A-MAN TEST SCALED SCORE 103, FIGURE WAS EXTREMELY SMALL	M.A.	9.0
74	PEABODY PICTURE VOCABULARY TEST M.A. = 8.9	IQ	102.0
30	VINELAND SOCIAL MATURITY SCALE SOCIAL AGE 7.4. SAT UP AT 6 MONTHS, WALKED AT 12 MONTHS, 1ST WORD AT 3 YEARS, 1ST SENTENCE AT 4 YEARS, SOCIAL MATURITY SCORE LOWERED BECAUSE OF COMMUNICATION ITEMS.	SQ	84.0

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A6

117	DURRELL ORAL READING MAJOR ERROR = OMISSIONS OF HAS, CAN, AND IS	GRADE	1.8
118	DURRELL SILENT READING	GRADE	1.7
121	DURRELL WORD ANALYSIS	GRADE	1.4
122	DURRELL SPELLING	GRADE(-)	2.0
124	DURRELL NAMING LETTERS		
125	DURRELL VISUAL MEMORY OF WORDS	GRADE	2.9
127	DURRELL SPELLING-VISUAL MEMORY	GRADE(-)	4.0
143	AUDIOMETRIC SCREENING 25 DB. AT 500, 2000, 4000, 8000 FR. WITHIN NORMAL LIMITS.		
146	WEPMAN AUDITORY DISCRIMINATION TEST 7X ERRORS. ABOVE AGE LIMIT.		
76	WIDE-RANGE ACHIEVEMENT TESTS		
	WIDE-RANGE SPELLING AN(AND), CAD(CAT), CO(GO)	GRADE	1.6
	WIDE-RANGE ARITHMETIC	GRADE	3.2
	WIDE-RANGE READING OMISSIONS = WAS, WORK, HOW	GRADE	1.7

OF THE 180 MINUTES AVAILABLE FOR TESTING, THERE ARE 10 MINUTES REMAINING.

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SIMULATED DIAGNOSIS

Decision 2. (noon-staffing)

Your team now has three hours of diagnostic information. At this staffing you team will decide on what additional information you wish in the remaining two hours of the diagnostic session. Try to develop a tentative hypothesis and use the afternoon to test your ideas. The form below should be filled out in the same manner as DECISION 1.

Fill in the from for Decision 2 at the end of the noon-staffing session.

1. Diagnostic team name (maximum of 8 spaces)

__ __ __ __ __ __ __ __ __ __

2. Members of the Diagnostic Team. (maximum of 56 spaces)

3. Assessment information desired in the afternoon session. (Plan for two hours.) Put down the numbers of the information requested.

SAMPLE PRINTOUT
DECISION 2.

NORTHWESTERN UNIVERSITY
LEARNING DISABILITIES SIMULATION
DIAGNOSIS PROGRAM

SALLY SIMCASE 8.8 YEARS GRADE 3.1
REASON FOR REFERRAL READING PROBLEMS IN SCHOOL

NAME OF THE DIAGNOSTIC TEAM COWELENO
MEMBERS OF THE TEAM ARE CORSO,WEISS,LEWIS,NOLL

THIS IS THE INFORMATION GATHERED IN THE 120 MINUTES IN THE AFTERNOON SESSION

146	WEPMAN AUDITORY DISCRIMINATION TEST 7X ERRORS. ABOVE AGE LIMIT.			
34	DETROIT AUD. ATTENTION SPAN FOR UNRELATED WORDS		AGE	6.2
40	DETROIT AUD. ATTENTION SPAN FOR RELATED SYLLABLES		AGE	3.6
35	DETROIT ORAL COMMISSIONS		AGE	6.0
45	DETROIT ORAL DIRECTIONS		AGE	7.9
21	ITPA GRAMMATIC CLOSURE	SS 18	AGE	6.5
19	ITPA VERBAL EXPRESSION	SS 27	AGE	6.4
24	ITPA VISUAL SEQUENTIAL MEMORY	SS 42	AGE+	10.5
23	ITPA AUD. SEQUENTIAL MEMORY	SS 31	AGE	6.6
106	GATES-MACGINITIE COMPREHENSION		GRADE	2.3
27	ITPA AUDITORY ASSOCIATION	SS 23	AGE	6.8
100	GATES-MCKILLOP RECOGNIZING VISUAL FORM OF SOUNDS			
	NONSENSE WORDS		GRADE	3.0
	INITIAL LETTERS		GRADE	2.7
	FINAL LETTERS		GRADE	2.2
	VOWELS		GRADE	1.6

OF THE 120 MINUTES AVAILABLE FOR TESTING, THERE ARE 8 MINUTES REMAINING.

SIMULATED DIAGNOSIS

Decision 2. (noon-staffing)

Your team now has three hours of diagnostic information. At this staffing you team will decide on what additional information you wish in the remaining two hours of the diagnostic session. Try to develop a tentative hypothesis and use the afternoon to test your ideas. The form below should be filled out in the same manner as DECISION 1.

Fill in the from for Decision 2 at the end of the noon-staffing session.

1. Diagnostic team name (maximum of 8 spaces)

___ ___ ___ ___ ___ ___ ___ ___ ___ ___

2. Members of the Diagnostic Team. (maximum of 56 spaces)

3. Assessment information desired in the afternoon session. (Plan for two hours.) Put down the numbers of the information requested.

Decision 3 DIAGNOSTIC DECISIONS

1. What is your TEAM name?

2. Does the child have a learning disability?

3. What is the basis of your decision(e.g. formula, Developmental imbalances, intuition, etc. ?)

4. What areas of integrities does this child seem to have?

5. What areas of deficits does this child seem to have?

6. What are the present developmental levels for the child (by age, grade, or any other fashion) concerning any areas that you feel are pertinent; e.g. intelligence, motor social, language, academic, etc.?

7. Degree of emotional overlay (none, some, moderate, severe, primary, secondary, etc.)

```
XXXXXXXXXXXXXXXXXXXXXX
X                    X
X   TEAM DECISIONS   X
X                    X
XXXXXXXXXXXXXXXXXXXXXX
```


SAMPLE PRINTOUT
DECISION. 3.

DOES THIS CHILD HAVE A LEARNING DISABILITY--

TEAM SAFANSU
YES, INDEED

TEAM TEAMFOUR
YES

TEAM COVELENO
YES

TEAM OLOP
YES. WIDE DISCREPENCY BETWEEN VERBAL AND PERFORMANCE - RECEPTIVE AND EXPRESSIVE LANGUAGE - AUDITORY AND VISUAL PROCESSING

TEAM DIAGSAL
YES

BASIS OF DECISION

TEAM SAFANSU
FORMULA LEARNING QUOTIENT.80, TEST DATA, DEVELOPMENTAL IMBALANCE FROM LANGUAGE AND SPEECH REPORT

TEAM TEAMFOUR
AUD-VISUAL SKILLS DISCREPANCY. COMPREHENSION-USAGE DISCREPANCY IN ORAL LANGUAGE.

TEAM COVELENO
DEVEL IMBAL- DISCRP BETW VERB AND PERF SCORES, AUD AND VIS PERF BETW MEANINGFUL AND NON-MEANINGFUL TASKS NORMAL HEARING AND INTELL.

TEAM OLOP
DELAYED LANGUAGE DEVELOPMENT - EXPRESSIVE LANGUAGE, DOWN ON VOCAB-ULARY SUBTEST OF WISC, ITPA AUDITORY CLOSURE AND MEMORY, AUDITORY DISCRIM AFFECTING MEMORY AND SYMBOLIZATION

TEAM DIAGSAL
62 LEARNING QUOTIENT FOR READING AND SPELLING. DISCREPANCY BETWEEN PERFORMANCE AND VERBAL IQ ON WISC WITH INTERSUBTEST SCATTER.

AREAS OF INTEGRITIES

TEAM SAFANSU
ALL LEVELS OF VISUAL PROCESSING INTACT. ARITHMETIC SKILLS INTACT.

TEAM TEAMFOUR
HEARING, VISUAL PROCESSING, VISUAL-MOTOR, AUDITORY COMPREHENSION.

TEAM COWELENO
INTRASENSORY VISUAL PROCESSING

TEAM DLOP
VISUALLY STRONGER AS ON VISUAL SEQ. MEMORY, CLOSURE, MAZES, CODING.
VISUAL MOTOR INTACT - NUMBER FACILITY GOOD

TEAM DIAGSAL
CONCEPTUAL SKILLS NORMAL. MOTORIC DEVELOPMENT VISUAL SKILLS,
VISUAL-MOTOR SKILLS, AUDITORY ACUITY AND RECEPTION

AREAS OF DEFICITS

TEAM SAEANSU
AUDITORY PERCEPTION AND MEMORY. READING AND SPELLING.

TEAM TEAMFOUR
AUDITORY PROCESSING- MEMORY, DISCRIMINATION, SOUND BLENDING,
RETRIEVAL, EXPRESSIVE SYNTAX.

TEAM COWELENO
INTRASENSORY AUDITORY-DISCRIM SEQUENCING-MEMORY

TEAM DLOP
AUDITORY DISCRIM, AUDITORY MEMORY, EXPRESSIVE LANGUAGE - GAP IN
READING BEGINNING TO WIDEN BECAUSE OF LACK OF PHONIC SKILLS

TEAM DIAGSAL
AUDITORY EXPRESSION, MEMORY, AND DISCRIMINATION

DEVELOPMENTAL LEVELS

TEAM SAEANSU
VINELAND SOCIAL MATURITY 1.5 YEARS BELOW AGE LEVEL, INTELLIGENCE
AVG RANGE, PERFORMING 1 1/2 YRS BELOW GRADE LEVEL IN ALL AREAS OF
READING AND SPELLING, POOR EXPRESSIVE LANGUAGE,

TEAM TEAMFOUR
INTELLIGENCE 102 (VERBAL 96, PERF 119), SOCIAL MAT. 84, LANG
RECEPTIVE-AGELEVEL EXPRESSIVE- 2-3 YRS BELOW AGE LEVEL. VISUAL
MOTOR- ON AGE LEVEL, ARITH- 3RD GRADE, READING- SLILENT 2ND, ORAL 1.5

TEAM COWELENO
SOCIAL MATURITY- LOW DUE TO COMMUNICATION ITEMS, INTELL WITHIN
NORL RANGE. REC LANG APPEARS TO BE NORL. EXP LANG BELOW NORL DUE TO
AUD PROCESSING PROB MOTOR NORML READING-FIRST GRD SPELLING-BELOW 2ND

TEAM OLDP
RECEPTIVE AND EXPRESSIVE LANGUAGE BELOW AVERAGE, SOCIAL - BELOW
AVERAGE, READING-ONE YEAR BEHIND
INTELLIGENCE BROUGHT DOWN BY VERBAL PERFORMANCE. SOCIAL - AVERAGE

TEAM DIAGSAL
PERFORMANCE IQ 119, VERBAL IQ 84. WEPMAN 7X. WRAT SPEL1.6, READ
1.7. ITPA AUD REC 8.0 GRAM CL 6.5, AUD CL 5.9, SOUND BL 6.8, DETROIT
ATT UNREL WORDS 6.2, ITPA AUD SEQ MEM 6.5

DEGREE OF EMOTIONAL OVERLAY

TEAM SAFANSU
SOME.

TEAM TEAMFOUR
SECONDARY, SOME

TEAM COMELENO
NO TESTED

TEAM OLDP
MAY AFFECT MEMORY FOR SOUNDS. BECAUSE OF LATE LANGUAGE DEVELOPMENT,
THE EMOTIONAL OVERLAY IS AN EFFECT RATHER THAN A CAUSE.

TEAM DIAGSAL
MODERATE SECONDARY

ETIOLOGY

TEAM SAFANSU
UNKNOWN

TEAM TEAMFOUR

TEAM COMELENO
PREMATURITY EAR INFECTIONS-POSSIBLY

TEAM OLDP
POSSIBLE EARLY HEALTH HISTORY SIGNIFICANT AFFECTING HEARING

TEAM DIAGSAL
EARLY FLUCTUATING CONDUCTIVE HEARING LOSS DURING PERIOD FOR LANGUAGE
ACQUISITION. POSSIBLE NEUROLOGICAL DEFICIT AFFECTING AUDITORY
EXPRESSIVE LANGUAGE

DIAGNOSIS--MAJOR PROBLEM

TEAM SAFANSU
AUDITORY DYSLEXIC AND LANGUAGE DEFICIENCY.

TEAM TEAMFOUR
PREMATURE BIRTH, ILLNESS DURING LANGUAGE LEARNING AGE.
LEARNING DISABILITY IN AREA OF AUDITORY PROCESSING AFFECTING
ORAL LANGUAGE AND READING SKILLS, SOME EMOTIONAL OVERLAY.

TEAM COWELEND
READING PROBLEMS DUE TO AUDITORY PROCESSING DIFFICULTIES, MEMORY
PROBLEMS, CONCEPTUALIZATION AND DELAYED LANG

TEAM DLDP
AUDITORY-VOCAL BELOW AVERAGE CAUSING SPECIFIC LEA RNING DISABILITY
AFFECTING EXPRESSIVE LANGUAGE DEVELOPMENT, AUDITORY PROCESSING, AND
SOCIAL ADJUSTMENT

TEAM DIAGSAL
SEVERE AUDITORY DISCRIMINATION, MEMORY, AND EXPRESSIVE LA NGUAGE
PROBLEMS

SUGGESTED TEACHING PLACEMENT

TEAM SAFANSU
KEEP IN NORMAL CLASSROOM REFER TO L.D. TEACHER FOR READING
INSTRUCTION AND LANGUAGE DEVELOPMENT.

TEAM TEAMFOUR
ONE HOUR PER DAY WITH L.D. TEACHER, REMAIN IN REGULAR CLASS.

TEAM COWELEND
LD PLACEMENT WITH A DIAGNOSTIC CLINICAL TEACHING APPROACH

TEAM DLDP
REMAIN IN REGULAR CLASSROOM WITH REGULAR SESSION, WITH LEARNING
DISABILITIES TEACHER, COUNSELING FOR SOCIAL DEVELOPMENT

TEAM DIAGSAL
PUBLIC SCHOOL SETTING WITH LEARNING DISABILITY TRAINING DAILY

SUGGESTED APPROACH TO CLINICAL TEACHING

TEAM SAFANSU
SIGHT WORD APPROACH, CONTEXT, LEADING INTO PHONICS, UTILIZE
VISUAL STRENGTH TO BRING UP AUDITORY DEFICITS AND LANGUAGE
DEVELOPMENT,

TEAM TEAMFOUR
VISUAL AND INTERSENSORY VISUAL- AUDITORY TO BE USED IN
TEACHING READING. VISUAL CLES FOR DYSNOMIA WHOLE WORD APPROACH
TO READING VS PHONICS.

TEAM COWELEND
HOW MUCH DISCRIM PROBLEM CONTRIBUTES TO MEM AND CONCEPTUAL
PROB USE VISUAL REPRESENTATION TO STABILIZE THE AUDITORY

TEAM DLDP
USE VISUAL APPROACH WHILE STIMULATING PHONICS DEVELOPMENT. VISUAL STIMULI TO DEVELOPE VERBAL RESPONSES. HELP DEVELOPE CONCEPTS. GENERALIZATION AND CATEGORIZATION

TEAM DIAGSAL
USE VISUAL TO ESTABLISH ATTENTION AND REINFORCE WORK ON AUDITORY SKILLS. BASIC SIGHT WORD APPROACH MOVING TO STRUCTURAL ANALYSIS AND FINALLY TO PHONICS

FURTHER REFERRALS

TEAM SAFANSU
SPEECH THERAPY EVALUATION.

TEAM TEAMFOUR
(BLANK)

TEAM COWELENO
PSYCHOLOGICAL TESTING NEUROLOGICAL TESTING MOTOR TESTING ARITHMETIC ACHIEVEMENT FURTHER READING TESTING ORAL AND WRITTEN LANGUAGE

TEAM DLDP
COUNSELING, PRIVATE OR WITHIN SCHOOL SETTING. A NEUROLOGICAL EXAMINATION IS RECOMMENDED

TEAM DIAGSAL
NEUROLOGICAL AND PSYCHIATRIC

COMMENTS

TEAM SAFANSU
CASE HISTORY NOT COMPLETED FOR FURTHER INFORMATION ON ETIOLOGY AND EMOTIONAL COMPONENT.

TEAM TEAMFOUR
(BLANK)

TEAM COWELENO
(BLANK)

TEAM DLDP
REINFORCE MOTOR ABILITY THROUGH DANCING, GYM, AND/OR OTHER ACTIVITIES TO BUILD CONFIDENCE

TEAM DIAGSAL
BLANK

NAME____________________ Date________ A17

DECISION 4.. SELECTING TEACHING STRATEGIES

Team No.________

Student No.________

You have now spent an entire simulated day and several simulated staffing sessions evaluating and diagnosing the child under study. In this portion of the diagnosis you are asked to make decisions concerning teaching techniques.

Directions:

1. Read each of the teaching techniques listed below. Decide if it is a technique you would use (A); or you would not use (B) for the child you have been diagnosing.

2. If you choose (A) would use, indicate with a check (✓) whether you would choose the method to build a deficit area (D); or to teach the subject by using an intact modality or asset (A); or you would select the technique for other reasons (O).

3. If you choose (B) would not use, indicate whether you would choose this because (NA) the method is not applicable to this child; or (U) unknown--you do not know what the method is or you never heard of it.

Summary:

A { D--deficit; technique chosen to build a deficit area
A--asset; technique chosen to teach by using an intact process
O--other; technique chosen for other reasons }

B { NA--not applicable for this child
U---unknown }

		A (Would Use) D 1	A 2	O 3	B (Would Not Use) NA 4	U 5	
1. Use much practice in intersensory tasks	1						(3)
2. Use tachistoscope to increase rate of recognition of words	2						(1)
3. Intensification and structuring of sounds by therapist	3						(2)
4. Give much practice in putting puzzles together	4						(1)
5. Teach child to revisualize tasks before he performs	5						(1)
6. Go from gross to fine motor movements	6						(4)
7. Use of experience simultaneously with sounds	7						(2)
8. Begin with letter sounds, blending to words when teaching reading	8						(7)
9. Develop awareness of the difference between sound and no sound	9						(2)
10. Have the subject imitate sound and rhythm patterns	10						(2)
11. Use the Schuyler method to teach cognition	11						(3)
Have the child do exercises in visual scanning	12						(1)

Decision 4---continued.

Name____________________ Team No.________ Student No.________

		A (Would Use) D 1	A 2	O 3	B (Would Not Use) NA 4	U 5	
(2)							
13. Have the child practice copying designs	13						(1)
14. Help the subject localize sounds	14						(2)
15. Use the Fernald method	15						(7)
16. Develop awareness and recognition of non-verbal auditory patterns	16						(2)
17. Use experience stories to teach reading	17						(7)
18. Develop awareness of rhythms in sequences of words	18						(2)
19. Use traditional orthography to teach reading	19						(7)
20. Do work on lengthening the child's attention span	20						(6)
21. Use care in the selection of spoken vocabulary	21						(5)
22. Therapist should accept and then expand the subject's sentence	22						(5)
23. Give the subject tongue and blowing exercises	23						(4)
24. Teach subject to reauditorize before he performs arithmetic problems	24						(3)
(3)							
25. Therapist should encourage oral responses	25						(5)
26. Build basic number concepts	26						(3)
27. Go from part-word to whole-word approach to teach reading	27						(7)
28. Therapist should reduce sentence length and complexity	28						(5)
29. Go from concrete to abstract concepts as child can grasp them	29						(3)
30. Use whole-word approach rather than a part-word approach	30						(7)
31. Go from concrete to abstract parts of speech	31						(5)
32. Therapist should structure the environment to help the child learn	32						(6)
33. Teach the subject to monitor his own errors	33						(6)
34. There should be lots of verbal repetition in the therapy	34						(5)
35. Practice rapid naming of objects	35						(5)
36. Give the subject motor coordination exercises	36						(4)

Decision 4---continued.

Name______________________________ Team No.__________ Student No.________

			A (Would Use)			B (Would Not Use)		
			D 1	A 2	O 3	NA 4	U 5	
	(4)							
37.	Reduce the complexity of sounds	37						(2)
38.	Capitalize on the motor movements the subject can already do	38						(4)
39.	Give the subject large letters to manipulate	39						(7)
40.	Have the child work on syllabication of words and recognition of multisyllables	40						(7)
41.	Go from working on inner language to work on verbal oral language	41						(5)
42.	Help the child develop reading skills in the content areas	42						(7)
43.	Subject should imitate therapist's speech patterns	43						(5)
44.	Use the language master for remediation	44						(6)
45.	Teach reading using phonics approach	45						(7)
46.	Practice cross-pattern crawling	46						(4)
47.	Do much training of letters and designs	47						(4)
48.	Teach the child to quickly recognize body parts and body awareness	48						(4)
	(5)							
49.	Work on visual discrimination	49						(1)
50.	Work on visual memory	50						(1)
51.	Work on visual sequencing	51						(1)
52.	Help subject with non-verbal orientation skills	52						(3)
53.	Use "individualized reading" approach	53						(7)
54.	Use behavior modification techniques	54						(6)
55.	Find the subject's area of interest and build curriculum around interest	55						(6)
56.	Do work on social skills	56						(6)
57.	Immediately work on improving reading rate to develop great speed	57						(7)
58.	Develop subject's reading comprehension skills	58						(7)
59.	Use basal reader to teach reading	59						(7)
60.	Use Jones method to teach reading	60						(7)

REMEDIAL PROCEDURES FOR SALLY SIMCASE   02/23/72   PAGE 17

STUDENT PAMELA [redacted]   TEAM DIAGSAL .00000000

```
CATEGORY
                                         YOUR SCORE                                         CLASS SCORE
                      PERCENTAGE:  0        25        50        75       100          0        25        50        75       100
VISUAL PROCESSING       (100.0)XXXXXXXXXIXXXXXXXXXIXXXXXXXXXIXXXXXXXXXI     ( 83.4)XXXXXXXXXIXXXXXXXXXIXXXXXXXXXIXXXX
AUDITORY PROCESSING     ( 74.3)XXXXXXXXXIXXXXXXXXXIXXXXXXXXX                ( 67.1)XXXXXXXXXIXXXXXXXXXIXXXXXX
ARITHMETIC-COGNITION    ( 95.7)XXXXXXXXXIXXXXXXXXXIXXXXXXXXXIXXXX           ( 69.3)XXXXXXXXXIXXXXXXXXXIXXXXXXX
MOTOR                   ( 75.0)XXXXXXXXXIXXXXXXXXXIXXXXXXXXXI               ( 88.1)XXXXXXXXXIXXXXXXXXXIXXXXXXXXXIXXXXX
LANGUAGE AND SPEECH     ( 75.0)XXXXXXXXXIXXXXXXXXXIXXXXXXXXXI               ( 57.2)XXXXXXXXXIXXXXXXXXXIXX
BEHAVIOR                ( 42.9)XXXXXXXXXIXXXXXXX                            ( 49.3)XXXXXXXXXIXXXXXXXXX
READING                 ( 69.3)XXXXXXXXXIXXXXXXXXXIXXXXXXX                  ( 60.3)XXXXXXXXXIXXXXXXXXXIXXXX
```

-POINTS-

STUDENT TOTAL: 218.

CLASS AVERAGE: 198.

DELPHI GROUP SCORE: 300.

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E PRINTOUT
DECISION 4

A20

SAMPLE PRINTOUT
DECISION 4

NAME	NUMBER	TEAM NAME		CATEGORY SCORES (PER CENT) 1	2	3	4	5	6	7	TOTAL (POINTS)
CORINNE [redacted]	20	COWFLENO		100.0	82.9	85.7	87.5	47.5	57.1	53.3	208.0
RICHARD [redacted]	100	COWFLENO		100.0	71.4	71.4	100.0	45.0	42.9	60.0	203.0
SUZANNE [redacted]	160	COWFLENO		80.0	80.0	71.4	87.5	57.5	42.9	58.7	198.0
SAM [redacted]	190	COWFLENO		51.4	60.0	71.4	87.5	72.5	57.1	53.3	188.0
SUE [redacted]	200	COWFLENO		65.7	80.0	57.1	87.5	57.5	42.9	53.3	184.0
LEE [redacted]	80	DLDF		85.7	37.1	71.4	75.0	57.5	28.6	36.0	158.0
DEE [redacted]	90	DLDF		94.3	37.1	57.1	100.0	95.0	42.9	62.7	206.0
DEBORAH [redacted]	110	DLDF		100.0	57.1	57.1	87.5	85.0	71.4	73.3	224.0
ANN CA[redacted]	30	SEANSU		82.9	57.1	71.4	87.5	57.5	71.4	68.0	208.0
SAM [redacted]	50	SEANSU		85.7	65.7	28.6	62.5	57.5	28.6	54.7	162.0
IRENE [redacted]	140	SEANSU		80.0	94.3	71.4	100.0	70.0	28.6	52.0	203.0
SUZIE [redacted]	170	SEANSU		85.7	88.6	85.7	100.0	45.0	28.6	53.3	199.0
KATHLEEN [redacted]	10	TEAMFOUR		68.6	65.7	57.1	100.0	45.0	85.7	80.0	215.0
MERLE BI[redacted]	60	TEAMFOUR		65.7	51.4	57.1	87.5	60.0	28.6	80.0	190.0
CAROL [redacted]	150	TEAMFOUR		100.0	65.7	85.7	100.0	32.5	57.1	69.3	213.0
E. [redacted]	210	TEAMFOUR		57.1	85.7	28.6	75.0	50.0	71.4	66.7	185.0
PAMELA [redacted]	40	DIAGSAL	*00000000	100.0	74.3	85.7	75.0	75.0	42.9	69.3	218.0
CLAUDIA [redacted]	70	DIAGSAL	*00000000	100.0	68.6	100.0	100.0	62.5	57.1	62.7	226.0
MARIE [redacted]	120	DIAGSAL	*00000000	80.0	80.0	71.4	100.0	47.5	28.6	53.3	190.0
ROBERT [redacted]	130	DIAGSAL	*00000000	85.7	40.0	100.0	62.5	25.0	71.4	46.7	174.0
		CLASS AVERAGES:		83.4	67.1	69.3	88.1	57.2	49.3	60.3	197.6

DELPHI GROUP SCORE: 300.0 POINTS

```
              PROGRAM DIAGNOS (INPUT, OUTPUT)
000003        DIMENSION IEACH(158), LIMIT(158), NM(158,7), SCOR1(158),SCOR2(158)
000003        DIMENSION COM1(158,25), COM2(158,25), COM3(158,25), COM4(158,25)
000003        DIMENSION COM5(158,25), COM6(158,25), COM7(158,25), COM8(158,25)
000003        DIMENSION COM9(158,25), A(5), GRPNM(15), ICODE(15), GRPLM(15,7)
000003        DIMENSION NTEST(15,36), ITEST(15, 36)
        C
        C*****************************************************************
        C
        C          READ IN AND PRINT OUT OF CHILD.S NAME, GRADE, AGE, AND REASON
        C               FOR REFERRAL
        C          CHD1, CHD2 = CHILD.S NAME
        C          GRADE = CHILD.S GRADE IN THE FORM **.*
        C          IAGE = CHILD.S AGE IN THE FORM **.*
        C          A(K) = REASON FOR REFERRAL
        C
        C*****************************************************************
        C
000003        READ 1, CHD1, CHD2, GRADE, IAGE, (A(K), K=1,5)
000025      1 FORMAT (2A8, X, F4.1, X, F4.1, X, 5A8)
        C
        C*****************************************************************
        C
        C          IEACH(I) = NUMBER OF CARDS ASSOCIATED WITH TEST NUMBER
        C          LIMIT(I) = TIME NECESSARY FOR TEST ADMINISTRATION
        C          NM(I,J) = NAME OF TEST
        C          SCOR1(I), SCOR2(I) = SCORE ON THE TEST
        C          COM1(I,J) TO COM9(I,J) = INFORMATION CONTAINED ON THE REST OF
        C               THE CARDS ASSOCIATED WITH THIS PARTICULAR TEST NUMBER
        C
        C*****************************************************************
        C
000025        DO 20 I=1,158
000027        READ 5, IEACH(I), LIMIT(I), (NM(I,J),J=1,7), SCOR1(I), SCOR2(I)
000052      5 FORMAT (I2, I3, X, 6A8, A5, A8, F5.1)
000054        IE = IEACH(I) - 1
000055        IF (IE .EQ. 0) GO TO 20
000056        DO 15  J=1, IE
000057        READ 10,COM1(I,J), COM2(I,J), COM3(I,J), COM4(I,J), COM5(I,J),
             X   COM6(I,J), COM7(I,J), COM8(I,J), COM9(I,J)
000117     10 FORMAT (A4, 8A8, A4)
000117     15 CONTINUE
000122     20 CONTINUE
        C
        C*****************************************************************
        C
        C          READ IN AND PRINT OUT GROUP NAME, GROUP MEMBERS, AND WHICH SESSION.
        C          GRPNM(L) = GROUP NAME
        C          ICODE(L) = 2 IF AFTERNOON SESSION, 1 IF MORNING SESSION
        C          GRPLM(L) = NAMES OF GROUP MEMBERS
        C          M = NON-ZERO IF GROUP IS THE LAST ONE READ IN
        C          ITMAX = NUMBER OF MINUTES IN DIAGNOSTIC SESSION
        C          IT = NUMBER OF MINUTES  LEFT IN DIAGNOSTIC SESSION
        C
        C*****************************************************************
        C
000124        L = 1
```

```
000123     25  READ 30, N, GRPNM(L), ICODE(L), (GRPLB(L,N),N=1,7)
000140     30  FORMAT (I1, X, A8, X, I1, X, 7A8)
000145         ITMAX = 120
000147         IF (ICODE(L) .EQ. 1)  ITMAX = 180
000153         IT = ITMAX
000155         PRINT 31,CHD1, CHD2, IAGE, GRADE,  (A(K),K=1,5)
000176     31  FORMAT (1H1, 11X, *NORTHWESTERN UNIVERSITY*/ 12X*LEARNING DISABILI
              XTIES SIMULATION*/ 12X, *DIAGNOSIS PROGRAM*// 12X, 2A8, 2X, F4.1,
              X  A, *YEARS*, X, *GRADE*, X, F4.1,/ 12X, *REASON FOR REFERRAL*,
              X X, 5A8)
000176         PRINT 35, GRPNM(L), (GRPLB(L,N), N=1,7)
000213     35  FORMAT(1H0,11X,*NAME OF THE DIAGNOSTIC TEAM*,2X, A8/12X,*MEMBERS O
              XF THE TEAM ARE*,2X,  7A8)
           C
           C***********************************************************************
           C
           C        READ IN AND PRINT OUT  TEST NUMBERS SELECTED BY THE TEAM.
           C        TEST = TEST NUMBER SELECTED
           C        JJ = NUMBER OF TESTS THAT HAVE BEEN SELECTED
           C        STEPS TO DETERMINE IF TEST NUMBER SELECTED IS TOO HIGH.
           C
           C***********************************************************************
           C
000213         READ 40, (NTEST(L,II), II=1,36)
000226     40  FORMAT (18(I3, X) / 18( I3, X))
000226         JJ = 0
000227         DO 55 II= 1, 36
000231         IF (NTEST(L,II) .EQ. 0) GO TO 55
000234         IF(NTEST(L,II).LT.159) GO TO 50
000237         PRINT 45, NTEST(L,II)
000247     45  FORMAT(1H0,12X,*THE TEST NUMBER *,I3,* IS TOO HIGH.  TRY AGAIN.*)
000247         GO TO 55
000250     50  JJ = JJ + 1
000252         ITEST(L,JJ) = NTEST(L,II)
000257     55  CONTINUE
           C
           C***********************************************************************
           C
           C        PRINT OUT THE NAMES AND SCORES OF THE TESTS SELECTED
           C
           C***********************************************************************
           C
000261         DO 95 KK = 1, JJ
000263         I = ITEST(L,KK)
000266         IF (IT - LIMIT(I) .LT. 0) GO TO 60
000271         IT = IT - LIMIT(I)
000272         GO TO 70
000273     60  PRINT 65, I
000301     65  FORMAT(1H0,12X,*THERE IS TOO LITTLE TIME TO ADMINISTER TEST NO.*,
              X  A, I3)
000301         GO TO 90
000302     70  PRINT 75, I, (NM(I,J), J=1,7), SCOR1(I), SCOR2(I)
000324     75  FORMAT (1H0,12X, I3,4X, 6A9, A5, A8, F5.1)
000324         IF (IEACH(I)-1 .EQ. 0) GO TO 90
000327         IE = IEACH(I)-1
000330         DO 85  MM=1, IE
000332         PRINT 80, COM1(I,MM), COM2(I,MM),COM3(I,MM),COM4(I,MM),COM5(I,MM),
              X COM6(I,MM), COM7(I,MM), COM8(I,MM), COM9(I,MM)
```

```
000372     80  FORMAT (1H , 17X, RAP, A4)
000372     85  CONTINUE
000375     90  CONTINUE
000375     95  CONTINUE
000400         PRINT 100, ITMAX, IT
000407    100  FORMAT (1H0, 11X, *OF THE*, X, I3, X, *MINUTES AVAILABLE FOR TESTI
              XNG, THERE ARE*, X, I3, X,*MINUTES REMAINING.*)
000407         IF (M .GT. 0) STOP
000413         L = L + 1
000415         GO TO 25
000415         END
```

PROGRAM CREATE A25
VERSION 2-... PART 1.)


```
      PROGRAM CREATE (INPUT,OUTPUT,TAPE1=INPUT,TAPE2)
C*************************************************************************
C
C          THIS PROGRAM CREATES A RANDOM ACCESS FILE KEYED ON TEST
C          NUMBER.  CONTAINED IN THIS FILE IS THE TEST NAME AND
C          NUMBER AND ANY PERTINENT INFORMATION REGARDING THE STUDENT#S
C          PERFORMANCE.
C
C*************************************************************************
C*************************************************************************
C
C          THE FILE IS CREATED FROM DATA CARDS WHICH ARE ENTERED AS
C          PART OF THIS PROGRAM.  THE CARD FORMAT IS=
C              COL. 1-2     NUMBER OF LINES OF TEST DESCRIPTION
C              COL3-5       NUMBER OF MINUTES NECESSARY TO ADMINISTER
C                           THE TEST
C              COL.6        BLANK
C              COL.7-56     TEST NAME AND OTHER DESCRIPTIVE INFORMATION
C              COL. 57-59   NUMBER USED TO IDENTIFY THE TEST
C              COL. 60-67   INFORMATION PERTINENT TO THE STUDENT#S
C                           PERFORMANCE ON THE TEST
C              COL. 68-72 STUDENT#S AGE PERFORMANCE ON THE TEST
C          THE FOLLOWING IS A SAMPLE=
C 14060 WECHSLER INTELLIGENCE SCALE FOR CHILDREN            COIFULL 120.0
C       WISC VERBAL 125, WISC PERFORMANCE 110
C 01005 WISC INFORMATION                                    00255    14.0
C
C*************************************************************************
000003      DIMENSION INDEX (601),INP (14),IOUT (14)
000003      K=300
000004      IS=0
000005      CALL OPENMS (2,INDEX,601,0)
000010      READ (1,1)  (IOUT (J),J=1,12)
000022  1   FORMAT (I2,I3,X,6A8,A2,I3,A8,F5.1)
000022      IF (EOF(1)) 1000,10
000026  10  READ (1,1) (INP(J),J=1,12)
000040      IF (EOF(1)) 1002,20
000044  20  IF (INP(10) .EQ. 0) GO TO 50
000045      IS=0
C*************************************************************************
C
C          AN INDEX OF 601 HAS BEEN ESTABLISHED FOR THE RANDOM FILE.
C          THE FIRST 299 POSITIONS ARE RESERVED FOR THE FIRST LINE OF
C          DESCRIPTIVE INFORMATION.  POSITIONS 300 TO 600 ARE RESERVED
C          FOR STORING ADDITIONAL LINES OF TES DESCRIPTION.
C
C*************************************************************************
000044      IF (INP(10) .GT. 299) GO TO 40
000051      IOUT (13)=0
000051      IOUT(14)=0
000052  25  CALL WRITMS (2,IOUT,14,IOUT(10))
000055      PRINT 888,(IOUT(J),J=1,14)
000067  888 FORMAT(1X,I2,I3,  6A8,A2,I3,A8,F5.1,I5,I5)
C*************************************************************************
C
C          RECORD DESCRIPTION OF RANDOM FILE
C              FIELD 1      NUMBER OF LINES OF TEST DECRIPTION
```

```
C                 FIELD 2       NUMBER OF MINUTES NECESSARY TO ADMINISTER
C                 FIELD 3-FIELD 9  TEST NAME AND OTHER DESCRIPTIVE
C                 FIELD 10      NUMBER IDENTIFYING TEST
C                 FILED 11      INFORMATION PERTINENT TO THE STUDENT#S
C                               PERFORMANCE ON THE TEST
C                 FIELD 12      STUDENT#S AGE PERFORMANCE ON TEST
C                 FIELD 13      POINTER TO ALTERNATE AREA OF THE RANDOM FILE
C                               WHERE ADDITIONAL INFORMATION PERTAINING TO
C                               TO THE TEST CAN BE FOUND.  THIS ADDITIONAL
C                               INFORMATION IS NOT ITSELF ANOTHER TEST.
C                 FIELD 14      A COUNT OF THE NUMBER OF LINES WHICH WILL
C                               BE FOUND IN AN ALTERNATE PORTION OF THE
C                               RANDOM FILE
C
C*************************************************************************
 30   DO 35 J=1,12
 35   IOUT(J)=INP(J)
      ISW=1
      GO TO 10
 40   PRINT 3,INP(10)
 3    FORMAT (1H1,*OVERFLOW OF INDEX*,I3)
 1000 STOP
 50   IOUT (13)=K
      ICNT=0
 60   INP (13)=0
      INP(14)=0
      CALL WRITMS (2,INP,14,K)
      PRINT 888,(INP(J),J=1,14)
      K=K+1
      ICNT=ICNT+1
      IF (K.GT. 600) GO TO 45
      READ (1,1) (INP(J),J=1,12)
      IF (EOF(1)) 1001,65
 65   IF (INP(10) .EQ. 0) GO TO 60
      IOUT(14)=ICNT
      GO TO 25
 45   PRINT 2,K
      STOP
 1001 IOUT(14)=ICNT
      CALL WRITMS(2,IOUT,14,IOUT(10))
      PRINT 888,(IOUT(J),J=1,14)
      STOP
 1002 IOUT(13)=0
      IOUT(14)=0
      IF (ISW .EQ. 1) CALL WRITMS(2,IOUT,14,IOUT(10))
      PRINT 888,(IOUT(J),J=1,14)
      STOP
      END
```

PROGRAM SIMCASE
New Version (PART 2)

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```
      PROGRAM SIMCASE (INPUT,OUTPUT,TAPE1=INPUT,TAPE2)
C*********************************************************************
C
C          THIS PROGRAM PRINTS OUT THE TEST SELECTED BY EACH DIAGNOSTIC
C          TEAM AND INDICATES THE NUMBER OF MINUTES OF TESTING THE TEAM
C          REQUESTED.
C
C          THE INPUT DECK SETUP IS AS FOLLOWS
C              CARD 1-2        INFORMATION REGARDING CHILD THAT IS TO BE
C                                STUDIED.
C              CARD 3          INFORMATION INDICATING THE MAXIMUM ACCEPTABLE
C                              TEST ID. NUMBER, INFORMATION REGARDING
C                              SESSION NUMBER AND THE NUMBER OF MINUTES
C                              IN THE DIAGNOSTIC SESSION IN QUESTION
C              CARD 4          INFORMATION REGARDING THE DIAGNOSTIC TEAM.
C              CARD 5 *        TESTS REQUESTED BY THE DIAGNOSTIC TEAM
C                              A 999 TEST MUST APPEAR AS THE LAST TEST
C                              REQUESTED BY A TEAM
C          THERE IS A CARD 3 FOR EACH DIAGNOSTIC TEAM AND THERE ARE
C          ONE OR MORE CARD 4S FOR EACH TEAM
C
C*********************************************************************
C
      COMMON/NAME/GRPNM,GRPLB(7),LNCNT
      DIMENSION A(16),INDEX(601),INP(14)
      DIMENSION ITEST(20)
      REAL IAGE
C
C*********************************************************************
C
C          READ IN AND PRINT OUT OF CHILD*S NAME,  GRADE, AGE, AND
C                REASON FOR REFERRAL
C          CHD1, CHD2 = CHILD*S NAME
C          GRADE = CHILD*S GRADE IN THE FORM **.*
C          IAGE = CHILD*S AGE IN THE FORM **.*
C          A(K) = REASON FOR REFERRAL
C
C          THIS INFORMATION IS READ IN FROM DATA CARDS.  THE CARD
C          FORMAT IS-
C            CARD 1
C              COL. 1-16   THE CHILD*S NAME
C              COL. 17     BLANK
C              COL. 18-21  THE CHILD*S GRADE
C              COL. 22     BLANK
C              COL. 23-26  THE CHILD*S AGE
C              COL. 27     BLANK
C              COL. 28-80  THE REASON FOR REFERRAL
C            CARD 2
C              COL. 1-80   THE REASON FOR REFERRAL
C
C*********************************************************************
C
      CALL OPENMS(2,INDEX,601,0)
      READ (1,1) CHD1,CHD2, GRADE,IAGE, (A(K), K=1,14)
    1 FORMAT (2A8, X, F4.1,X, F4.1,X, 5A10,A3/8A10)
      IF (EOF(1)) 998,10
C
```

```
C*****************************************************************************
C
C          READ IN THE SESSION NUMBER AND THE NUMBER OF MINUTES
C          ALLOCATED TC THE SESSION.
C          LIMIT = MAXIMUM IDENTIFYING NUMBER GIVEN TO THE TESTS THAT
C                  CAN BE REQUESTED
C         ICODE = 2 IF AFTER NOON SESSION, 1 IF MORNING SESSION
C         ITMAX = NUMBER OF MINUTES IN DIAGNOSTIC SESSION
C          THE CARD FORMAT IS-
C               COL. 1-4    MAXIMUM TEST IDENTIFYING NUMBER
C               COL. 5      THE SESSION NUMBER
C               COL. 6-8    THE NUMBER OF MINUTES ALLOCATED TO THE
C                           SESSION
C
C*****************************************************************************
C
:34      10    READ (1,33) LIMIT,ICODE,ITMAX
346      33   FORMAT(I4,I1,I3)
346           IF (EOF(1)) 999, 5
         C
         C*****************************************************************************
         C
         C          READ IN AND PRINT OUT GROUP NAME, GROUP MEMBERS
         C           SESSION.
         C          GRPNM = GROUP NAME
         C          GRPLB(I) = NAMES OF GROUP MEMBERS
         C         IT = NUMBER OF MINUTES LEFT IN DIAGNOSTIC SESSION
         C
         C          THE CARD FORMAT IS
         C               COL. 1-8    DIAGNOSTIC TEAM NAME
         C               CCL. 9      BLANK
         C               COL. 10-65  NAMES OF TEAM MEMBERS
         C
         C*****************************************************************************
         C
.C052     5    READ (1,30) GRPNM, (GRPLB(N), N=1,7)
.C066    30    FORMAT (A8, X,7A8)
.C056          IF (EOF(1))110,105
.C072   105    IT = ITMAX
.C074          PRINT 31, CHD1, CHD2, IAGE, GRADE, (A(K), K=1,14)
.C115    31    FORMAT (1H1, 11X, *NORTHWESTERN UNIVERSITY*/ 12X,*LEARNING DISABIL
              XITIES SIMULATION*/ 12X, *DIAGNOSIS PROGRAM*// 12X,2A8,2X,F4.1,
              X X, *YEARS*, X, *GRADE*,X, F4.1,/ 12X, *REASON FOR REFERRAL*,
              X X,5A10,A3/1X,8A10)
.0115          PRINT 35, GRPNM,(GRPLB(N), N=1,7)
.0131    35    FORMAT (1H0, 11X,*NAME OF THE DIAGNOSTIC TEAM*, 2X,A8/12X,*MEMBERS
              Z OF THE TEAM ARE*, 2X, 7A8)
.0131          LNCNT=12
.0132          IF (ICODE .EQ. 1) GO TO 700
.0134          PRINT 801, ITMAX
.01-6   801    FORMAT(//20X,*THIS IS THE INFORMATION GATHERED IN THE *,I3,
              C * MINUTES OF THE AFTERNOON SESSION*/)
.0143    46    PRINT 8C1
.0146   8C1    FORMAT (1X,*NOTES*)
.0146          PRINT 802
.0152   802    FORMAT (1H0,6X,*. . . PLUS(+) REPRESENTS THE TEST CEILING-THE HIGH
              CEST*/12X,*SCORE CBTAINABLE ON THE TEST LISTED*)
.0152          PRINT 803
```

```
                     --- PROGRAM(INP,TAPE2) ...
    156    803  FORMAT(1H0,6X,*.  . . VALUE WHICH REPRESENTS THE BASE LEVEL-THE LOWEST
               C*/12X,*SCORE OBTAINABLE ON THE TEST  (STED*)
000156          CALL OVRFL(10)
           C
           C*************************************************************************
           C
           C         READ IN AND PRINT OUT TEST NUMBERS SELECTED BY THE TEAM.
           C        ITEST = TEST NUMBERS SELECTED
           C
           C          THE CARD FORMAT IS
           C              COL. 1-3     TEST NUMBER
           C              COL. 4       BLANK
           C              COL. 5-7     TEST NUMBER
           C              COL. 8       BLANK
           C              AND SO ON
           C
           C*************************************************************************
           C
000163      45  READ (1,40)  (ITEST(I), I=1,20)
000172      40  FORMAT (20(I3, X) )
000173          IF (EOF(1)) 996,50
           C
           C*************************************************************************
           C
           C        PRINT OUT THE NAMES AND SCORES OF THE TESTS SELECTED
           C
           C*************************************************************************
           C
000176      50  DO 95 KK= 1,20
000200          IF (ITEST (KK) .EQ.0) GO TO 95
000201          IF (ITEST(KK) .EQ. 999) GO TO 96
000203          IF((ITEST(KK) .GT. LIMIT).OR. (ITEST(KK) .LE. 0)) GO TO 59
000213          CALL READMS (2, INP, 14, ITEST (KK))
000216          K = ITEST (KK)
           C
           C*************************************************************************
           C
           C          THE TEST NAMES ARE STORED ON A RANDOM FILE.
           C          EACH RECORD ON THE RANDOM FILE CONTAINS THE FOLLOWING-
           C          INP(1) = NUMBER OF LINES ASSOCIATED WITH TEST NUMBER
           C          INP(2) = TIME NECESSARY FOR TEST ADMINISTRATION
           C          INP(3)-INP(9) = NAME OF TEST SELECTED
           C          INP(10) = IDENTIFYING NUMBER OF TEST
           C          INP(11)-INP(12) = INFORMATION PERTINENT TO TEST SCORE
           C          INP(13) = POINTER TO CONTINUATION LINES
           C          INP(14) = NUMBER OF CONTINUATION LINES
           C
           C*************************************************************************
           C
000220          IF (IT - INP (2)  .LT.0) GO TO 60
000223          IT =IT - INP (2)
000224          IF (INP(12) .EQ. 0) GO TO 98
000225      70  PRINT 75,ITEST(KK),(INP(I),I=3,9 ,(INP(I),I=11,12)
000247      75  FORMAT (1H0,12X, I3,4X, 6A6,A2,1X,F5,1)
000247          GO TO 77
000250      98  PRINT 83,ITEST(KK),(INP(I),I=3,9),INP(11)
000266      83  FORMAT (1H0,12X, I3,4X, 6A6,A2,A8)
000266      77  CALL OVRFL(2)
```

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```
000270        IF (INP (1) .EQ.1) GO TO 95
000272        IE = INP (1) - 1
000273        IF (INP(13) .NE. 0) GO TO 200
000274        K=K+1
000275   85   CALL READYS (2,INP,14,K)
000300        IF (INP(12) .EQ. 0) GO TO 97
000301        PRINT 80, (INP(I),I= 3,9),(INP(I),I=11,12)
000321   80   FORMAT (40X,6A8,A2,A8,F8,.)
000321        GO TO 84
000322   97   PRINT 81, (INP(I),I= 3,9),INP(11)
000336   81   FORMAT (20X,6A8,A2,A8)
000336   84   CALL OVRFL(1)
000340        IE=IE-1
000342   86   IF (IE .EQ. 0) GO TO 95
000343        IF (INP(13) .NE. 0) GO TO 200
000344        K=K+1
000346        GO TO 85
000346  200   J=INP(13)
000347        ICNT=INP(14)
000351        DO 87 II=1,ICNT
000352        CALL READYS(2, INP, 14, J)
000356        IF (INP(12) .EQ. 0) GO TO 99
000367        PRINT 80, (INP(I),I= 3,9),(INP(I),I=11,12)
000377        GO TO 88
000401   99   PRINT 81, (INP(I),I= 3,9),INP(11)
000414   88   CALL OVRFL(1)
000415        IE=IE-1
000420   87   J=J+1
000424        IF(IE .EQ. 0) GO TO 95
000425        K=K+1
000426        GO TO 85
000427   59   PRINT 106, ITEST(KK)
000435  106   FORMAT(1H0,*THE TEST NUMBER *, I4, * WAS NOT A CORRECT IDENTIFYING
             C NUMBER*)
000435        CALL OVRFL(2)
000437        GO TO 46
000440   60   PRINT 65, ITEST(KK),(INP(I),I=3,9)
000454   65   FORMAT(1H0, 12X, I3, 4X, 6A8, A2, A8)
000454        PRINT 67
000462   67   FORMAT(1X,12X,*THERE IS TOO LITTLE TIME TO ADMINISTER THIS TEST*)
000462        CALL OVRFL(2)
000462   95   CONTINUE
000464        GO TO 45
000465   96   PRINT 100, ITMAX,IT
000475  100   FORMAT (1H0,11X,*OF THE*, X, I3, X, *MINUTES AVAILABLE FOR TESTING
             Z, THERE ARE*, X, I3, X, *MINUTES REMAINING.*)
000475        GO TO 5
000476  700   PRINT 810,ITMAX
000504  810   FORMAT (//30X,*THIS IS THE INFORMATION GATHERED IN THE *,I3,
             C * MINUTES OF THE MORNING SESSION*/)
000504        GO TO 46
000505  110   STOP
000507  996   PRINT 6
000513    6   FORMAT (1H1, 9995 OMITTED FROM LAST RECORD*)
000513        STOP
000515  998   PRINT 4
000521    4   FORMAT(1H1, *CHILD*S CASE HISTORY CARD WAS OMITTED*)
000521        STOP
```

```
000523    999  PRINT 3
000527    3    FORMAT(1H1,*SESSION CARD WAS OMITTED*)
000527         STOP
000531         END
```

```
                SUBROUTINE OVRF_(ICNT)
000003          COMMON/NAME/GRPNM,GRP_BIT ,LNCNT
000003          LNCNT=LNCNT+ICNT
000004          IF (LNCNT .LE. 60) RETURN
000010          PRINT 1
000014    1     FORMAT(1H1,126X,*PAGE 2*)
000014          PRINT 35, GRPNM,(GRP_B(N) , N=1,7)
000030    35    FORMAT (1H0, 11X,*NAME OF THE DIAGNOSTIC TEAM*, 2X,A8/12X,*MEMBERS
               Z OF THE TEAM ARE*, 2X, 7A8/)
000030          LNCNT=6
000031          RETURN
000032          END
```


A32

PROGRAM DIAGNOS

```
          PROGRAM DIAGNOS (INPUT, OUTPUT, TAPE60= INPUT, TAPE61= OUTPUT)
000003    DIMENSION DATA(13, 24, 10), DUMMY(8), N(13,10),QUES(5,13)
000003    DATA (QUES=
         1 50HTEAM
         2,50HDOES THIS CHILD HAVE A LEARNING DISABILITY--
         3,50HBASIS OF DECISION
         4,50HAREAS OF INTEGRITIES
         5 ,50HAREAS OF DEFICITS
         6,50HDEVELOPMENTAL LEVELS
         7,50HDEGREE OF EMOTIONAL OVERLAY
         8,50HETIOLOGY
         9,50HDIAGNOSIS--MAJOR PROBLEM
         X,50HSUGGESTED TEACHING PLACEMENT
         Y,50HSUGGESTED APPROACH TO CLINICAL TEACHING
         Z,50HFURTHER REFERRALS
         A,50HCOMMENTS                                        )
000003    J=0
000004    DO 100 I=1,13
000006    DO100 K=1,10
000007    N(I,K)=1
000013    DO100 J=1,24
000015 100 DATA(I,J,K)=8H
000031    IPAG=2
000032     I=0
000033    J=0
000034    K=1
000035  60 READ (60,1) IQUES, DUMMY
000045   1 FORMAT (I2, X, 7A10, A7)
000045    IF (EOF,60) 300,60
000050  60 IF(I-IQUES) 50,51,52
000053  51 J=J+8
000055    IF (J-16) 53,53,54
000057  53 N(I,K) = N(I,K)+1
000064 200 DO 201 NN=1,8
000066 201 DATA(I,NN+J,K)= DUMMY(NN)
000101    I=IQUES
000102    GO TO 60
000103  54 WRITE(61,2) IQUES, DUMMY
000113   2 FORMAT(X, *MORE THAN 3 CARDS FOR THIS QUESTION.*/X,*THIS CARD OMITTED*2X,I
         1TEM*2X,I2,  7A10, A7)
000113    STOP
000115  50 J=0
000116    IF(IQUES-14) 58,58,55
000121  58 I=IQUES
000123    GO TO 200
000123  52 IF (IQUES-1)  57, 56, 57
000125  56 K=K+1
000127    I=1
000130    J=0
000131    GO TO 200
000131  55 WRITE (61,3) IQUES, DUMMY
000141   3 FORMAT    (X, *CARD INCORRECTLY ORDERED OR PUNCHED*/X, I2,X7A10,A7)
000141    STOP
000143  57 WRITE (61, 15) IQUES, DUMMY
000153  15 FORMAT( X,*NEW TEAM NAME EXPECTED, CARD IS*/X,I2,X7A10,A7)
000153    STOP
000155 300 CONTINUE
```

```
  400 WRITE (61,21)
   21 FORMAT(1H1///[illegible] 1HX/50X, 1HX,3X,*TEAM DE
     1CISIONS* [illegible] 50X, 22(1HX)//)
      LNECNT=[illegible]
      DO 410 [illegible]=2,13
      WRITE(61,5) (QUES[illegible])
    5 FORMAT (1H[illegible], 5A1[illegible])
      LNECNT=LNECNT+2
      DO 410 KK=1,K
      WRITE(61,10) (DATA(1,J,KK))
   10 FORMAT (1H0,[illegible]X, *TEAM *,A10)
      NC= [illegible]
      IF (NC-2) 405,406,407
  405 WRITE(61, 11) (DATA ([illegible], J,KK), J=1,8)
   11 FORMAT ([illegible]X, 7A10, 2F[illegible])
      LNECNT=LNECNT+3
      GO TO 401
  406 WRITE (61,11) (DATA([illegible],J, KK), J=1,8)
      WRITE (61,11) (DATA([illegible],J, KK), J=9,16)
      LNECNT=LNECNT+4
      GO TO 401
  407 WRITE (61,11) (DATA(N,J, KK), J=1,8)
      WRITE (61,11) (DATA(N,J, KK), J=9,16)
      WRITE (61,11) (DATA(N,J, KK), J=17,24)
      LNECNT=LNECNT+5
  401 IF (LNECNT .LT. 57) GO TO 410
      WRITE (61,31) IPAG
   31 FORMAT (1H1,118X,*TEAM DECISIONS*/124X,*PAGE *,I2////)
      IPAG=IPAG+1
      LNECNT=7
  410 CONTINUE
      STOP
      END
```

PROGRAM TEACH
Decision 4


```
      PROGRAM    TEACH(INPUT,OUTPUT,TAPE5=INPUT,TAPE6=OUTPUT,TAPE1,TAPE2)
C*******************************************************************
C
C                          JOB DECK STRUCTURE
C
C                  JOB CARD WITH CONTROL CARDS FOLLOWING
C
C                  7-8-9 END OF RECORD
C
C                  SORT/MERGE CONTROL CARDS
C
C                  7-8-9 END OF RECORD
C
C                  BINARY DECK - THIS PROGRAM
C
C                  7-8-9 END OF RECORD
C
C                  PROGRAM INITIATION CARD
C                  CATEGORY DEFINITION CARDS
C                  TEAM DEFINITION CARDS
C                  WEIGHT DEFINITION CARDS
C
C                  7-8-9 END OF RECORD
C
C                  STUDENT RESPONSE CARDS
C
C                  6-7-8-9 END OF INFORMATION
C
C    *****  PROGRAM INITIATION CARD  *****
C
C    COL. 1-2    THE NUMBER OF QUESTION CATEGORIES
C    COL. 5-6    THE NUMBER OF TEAMS
C    COL. 9      THE MAXIMUM NUMBER OF QUESTIONS INSERTED BETWEEN
C                ANY TWO OF THE ORIGINAL 60 QUESTIONS
C    COL. 10-29  THE NAME OF THE SIMULATION STUDENT
C                (USED AS A TITLE FOR THE REPORTS)
C    COL. 32     BLANK - IF YOU WANT THE PROGRAM TO ABORT IN THE EVENT
C                OF INPUT ERRORS
C                NON-ZERO - CAUSES THE PROGRAM TO GENERATE REPORTS
C                OMITTING THE SCORES OF THE STUDENTS WHOSE INPUT
C                WAS IN ERROR
C
C    *****  CATEGORY DEFINITION CARDS  *****
C
C    FOR EACH CATEGORY, AS DEFINED IN THE WEIGHT DEFINITION CARDS:
C
C    COL. 1-20  THE CATEGORY NAME
C
C    EXPLANATION:  THE FIRST CATEGORY CARD READ BECOMES THE FIRST
C    CATEGORY NAME, IE THE NAME OF CATEGORY 1 AS CODED IN THE
C    WEIGHT DEFINITIONS
C
C    *****  TEAM DEFINITION CARDS  *****
C
C    ONE CARD FOR EACH TEAM:
C
C    COL. 1-3   THE NUMBER OF THE TEAM
C    COL. 5-24  THE NAME OF THE TEAM
C
C    *****  WEIGHT DEFINITION CARDS  *****
```

```
C     COL. 1-3    THE PRINCIPLE QUESTION NUMBER
C     COL. 4      THE NUMBER OF THE INSERTED QUESTION CORRESPONDING
C                 TO THE CORRESPONDING PRINCIPLE QUESTION. (BLANK IF
C                 NO INSERTION)
C     COL. 6      AN INTEGER GIVING THE CATEGORY NUMBER OF THIS QUESTION
C     COL. 10-14  THE WEIGHTS FOR EACH ANSWER
C                 ANSWER WEIGHTS ARE ASSUMED TO BE IN NUMERIC ORDER
C
C     ***** A BLUE END OF RECORD MUST FOLLOW THE LAST WEIGHT
C           DEFINITION CARD
C
C     ***** STUDENT RESPONSE CARDS *****
C
C     FOR EACH STUDENT:
C
C     FIRST CARD:
C     COL. 1      *1* DENOTING THE FIRST CARD
C     COL. 2-4    THE STUDENT*S TEAM NUMBER
C     COL. 5-8    THE STUDENT IDENTIFICATION NUMBER
C     COL. 9-29   THE NAME OF THE STUDENT
C
C     SECOND THROUGH N-TH CARDS:
C     COL. 1      THE CARD NUMBER, ANY INTEGER OTHER THAN 0 OR 1,
C                 DENOTING AN ANSWER CARD
C     COL. 2-4    THE STUDENT TEAM NUMBER
C     COL. 5-8    THE STUDENT IDENTIFICATION NUMBER
C
C     TWELVE SETS OF RESPONSES FOLLOW ON EACH CARD:
C     COL. 9      BLANK
C     COL. 10-11  THE PRINCIPAL QUESTION NUMBER (1 THRU 60 ONLY)
C     COL. 12     THE INSERTED QUESTION NUMBER (ZERO OR BLANK IF NONE)
C     COL. 13     THE LETTER CODE OF THE STUDENT RESPONSE
C                 (LEGAL CODES ARE 1 2 3 4 5 OR BLANK)
C     COL. 14     BLANK
C
C     IN FORTRAN:  FORMAT(I1,I3,I4,12(I3,I1,R1,1X))
C
C     SINCE THE STUDENT RESPONSES FORM THE LAST LOGICAL RECORD OF
C     THE JOB, A 6-7-8-9 END OF INFORMATION CARD SHOULD FOLLOW
C     THE LAST STUDENT RESPONSE CARD.
C
C             **********
C
C     NOTE:  RESPONSES ARE ALLOWED IN ANY ORDER.  A BLANK QUESTION
C     NUMBER SIGNALS THE END OF THE RESPONSES.
C     IF RESPONSES SHOULD RUN OUT TO THE LAST FIELD OF THE LAST CARD,
C     THE OCCURRENCE OF A CARD NUMBERED 1 WILL SUFFICE TO START
C     THE PROCESSING OF THE NEXT STUDENT.
C
C     ***** QUESTIONS *****
C
C     THIS PROGRAM IS WRITTEN TO HANDLE THE INSERTION OR DELETION
C     OF QUESTIONS INTO THE EXAMINATION.
C     THERE WERE 63 QUESTIONS INITIALLY.  IT IS ASSUMED THAT ALL
C     NEW QUESTIONS WILL BE INSERTED BETWEEN ANY TWO ORIGINAL OR
C     PRINCIPAL QUESTIONS.
C     THUS, QUESTIONS WILL BE NUMBERED
C     10., 11., 11.1, 12, AND SO FORTH.
C
C     IF AN ORIGINAL QUESTION IS TO BE REMOVED FROM THE GRADING
C     THE USER MAY LEAVE OUT ITS DEFINITION CARD.  THE USER MUST
C     BE AWARE THAT SUCH AN ACTION WILL PRODUCE AN ERROR IF USED
C     WITH STUDENTS WHO TOOK THE ORIGINAL VERSION OF THE TEST.
```

```
C     ***** WEIGHT DEFINITIONS *****
C
C     WEIGHT DEFINITIONS PROVIDE THE ABILITY TO GIVE PARTIAL CREDIT
C     TO ANSWERS ONLY PARTIALLY CORRECT.
C     ANOTHER METHOD OF ELIMINATING ONE OF THE ORIGINAL QUESTIONS IS
C     TO GIVE ALL OF ITS ANSWERS A ZERO WEIGHT.  SUCH ACTION WILL
C     RESULT IN LOWERING EACH STUDENT SCORE UNIFORMLY, DUE TO THE FACT
C     THAT THE PRESENCE OF A WEIGHT DEFINITION CARD AUTOMATICALLY
C     RESULTS IN THE ADDITION OF 5 POINTS TO THE POSSIBLE SCORE
C     OF ANY STUDENT.
C
C     ***** TEAM DEFINITION CARDS *****
C
C     TEAM DEFINITION CARDS ARE SET UP WITH TEAM NUMBERS SO THAT
C     EACH CLASS MAY HAVE TEAMS WITH UNIQUE NUMBERS.  THUS, STUDENTS
C     IN 1972 MAY HAVE TEAMS WITH THE SAME NAMES AS THOSE OF 1975
C     BUT ARE STILL DISTINGUISHABLE BECAUSE THEY HAVE DIFFERENT TEAM
C     NUMBERS.
C
C            **********
C
C         NOTICE THAT THE KEYED STRUCTURE OF THE RESPONSE FILE
C     MAKES IT SORTABLE.  SIMPLE PROGRAMS MAY BE WRITTEN TO RETRIEVE
C     INFORMATION FROM THE FILE.  IT MAY BE SORTED ALPHABETICALLY
C     BY STUDENT NAME, BY TEAM NUMBER (AS IT IS FOR THIS PROGRAM),
C     OR BY STUDENT IDENTIFICATION NUMBER
C
C*******************************************************************
      COMMON A(1)
      COMMON/WORDS/ASTU, PSCORE,ITITLE(2),EFLG
C
C     TAPE1 IS THE SORTED RESPONSE FILE
C     TAPE2 IS A SCRATCH FILE
C
C     INITIALIZE PROGRAM - READ PROGRAM DEFINITION CARD
C
      READ (5,500) NC,NT,NIQ,ITITLE,EFLG
  500 FORMAT (I2,2XI2,2XI1,2A10,2XF1.0)
C
C     NC IS THE NUMBER OF QUESTION CATEGORIES
C     NT IS THE NUMBER OF TEAMS
C     NIQ IS THE MAXIMUM NUMBER OF QUESTIONS INSERTED BETWEEN ANY
C     TWO OF THE 60 ORIGINAL QUESTIONS
C
      WRITE (6,600) NC,NT,NIQ,ITITLE
  600 FORMAT (1H1,3(/)20X*TEACHING TECHNIQUES INITIALIZATION VALUES*
     .2(/)20X*NUMBER OF QUESTION CATEGORIES:  *I6,
     .2(/)20X*NUMBER OF TEAMS:  *I2,
     .2(/)20X*MAXIMUM NUMBER OF QUESTIONS INSERTED BETWEEN ANY TWO ORIGI
     .NAL QUESTIONS:  *I1,
     .2(/)20X*NAME OF SIMULATION STUDENT:  *2A10)
C
C     SET UP STORAGE FOR THE FIRST ROUTINE
C
      NIQ = NIQ + 1
      NCA = NC*2
      NTN = NCA + NT
      NTA = NTN + NT*2
      NTS = NTA + NC
      NTSH = NTS + NC
      NTRM = NTSH + NC
      NW = NTRM + 60*NIQ*5
      LENGTH = NW + 60*NIQ
C
C     OPTIMIZE STORAGE
C
      CALL MEMORF (2,LENGTH)
```

```
      CALL SIMCASE (A(1),A(NCA+1),A(NTN+1),A(NTA+1),A(NTS+1),A(NTSM+1),
     .A(NTRM+1),A(NW+1),NC,NT,NIQ)
C
C     SET UP STORAGE FOR THE REPORT ROUTINE
C
      LENGTH = NTRM + 40*NC
      CALL MEMORF (2,LENGTH)
      CALL REPORT (A(1),A(NCA+1),A(NTN+1),A(NTA+1),A(NTS+1),A(NTSM+1),
     .A(NTRM+1),NC,NT)
      END
      SUBROUTINE SIMCASE (CNAME,TNOS,TNAME,TS,SUM,RSUM,W,C,NC,NT,NIQ)
      INTEGER CNAME(NC,2),TNOS(NT),TNAME(NT,2),SUM(NC)
     .,W(60,NIQ,5),C(60,NIQ)
      DIMENSION TS(NC),RSUM(NC)
      INTEGER Q(12),QS(12),QA(12),ANS(5)
      DIMENSION NW(5),NAME(2),NA(8)
      COMMON/WORDS/NSTUD,PSCORE,ITITLE(2),EFLG
      DATA (ANS(I),I=1,5)/1R1,1R2,1R3,1R4,1R5/
      DATA NSTUD/0/
      DATA PSCORE/0/
      DATA NERR/0/
      DATA IENDF1/0/
      DATA NCD/0/
      DATA  IZERO/0/
C
C     READ CATEGORY DEFINITION CARDS
C
      WRITE (6,600)
  600 FORMAT (1H12(/)20X*CATEGORY  NAME*2(/))
      DO 10 I = 1,NC
      READ (5,500) (CNAME(I,J),J=1,2)
  500 FORMAT (2A10)
      WRITE (6,601) I,(CNAME(I,J),J=1,2)
  601 FORMAT (23XI2,5X2A10)
      RSUM(I) = 0
      SUM(I) = 0
      TS(I) = 0
   10 CONTINUE
C
C     READ TEAM DEFINITION CARDS
C
      WRITE (6,602)
  602 FORMAT (5(/)20X*TEAM   NAME*2(/))
      DO 20 I = 1,NT
      READ (5,501) TNOS(I),(TNAME(I,J),J=1,2)
  501 FORMAT (I3,1X2A10)
      WRITE (6,603) TNOS(I),(TNAME(I,J),J=1,2)
  603 FORMAT (20XI3,3X2A10)
   20 CONTINUE
C
C     READ WEIGHT DEFINITION CARDS
C
      DO 30 I = 1,60
      DO 30 J = 1,NIQ
      DO 30 K = 1,5
      W(I,J,K) = -1
   30 CONTINUE
      WRITE (6,604)
  604 FORMAT (1H12(/)20X*WEIGHT DEFINITIONS*
     .2(/)20X*QUESTION  1  2  3  4  5 CATEGORY*/)
    1 READ (5,502) I,J,K,NW
  502 FORMAT (I3,I1,1XI1,3X5I1)
      IF ( EOF(5) .NE. 0. ) GO TO 2
      NCD = NCD + 1
```

```
      WRITE (6,604)
      NCD = 0
   11 J = J + IZERO
      WRITE (6,609) I,J,NW,K
  609 FORMAT (21X,I3*,*I1,2X5(1XI2)5XI2)
      J = J + 1
      DO 40 L = 1,5
      W(I,J,L) = NW(L)
   40 CONTINUE
      C(I,J) = K
      TS(K) = TS(K) + 5
      PSCORE = PSCORE + 5
      GO TO 1
C
C     COMPUTE STUDENT SCORES
C
    2 READ(1,100) NCD,NOT,NOS,NAME
  100 FORMAT (I1,I3,I4,2A10)
      IF ( EOF(1) .NE. 0. ) GO TO 71
      IF ( NCD .EQ. 1 ) GO TO 3
      IF ( NERR .EQ. 0 ) WRITE (6,606)
  606 FORMAT (1H110X5(1H*)2X*ERROR MESSAGES*2X5(1H*))
      WRITE (6,611) NCD,NTM,NSTD,NAME
  611 FORMAT (2(/)10X5(1H*)*  FATAL ERROR  *5(1H*)
     ,2(/)20X*INPUT FILE OUT OF SEQUENCE*
     ,2(/)20X*LAST CARD READ:  CARD NO,*I3*  TEAM NO,*I5*  STUDENT NUMBE
     ,R*I6*  NAME *2A10)
   41 CALL SLITE (1)
      CALL REMARK (17HFATAL INPUT_ERROR)
      CALL EXIT
    3 READ (1,101) NCD,NTM,NSTD,NA
  101 FORMAT (I1,I3,I4,7A10,A2)
      IF ( EOF(1) .NE. 0. ) GO TO 71
      IF ( NCD .EQ. 1 ) GO TO 4
      IF ( NSTD .EQ. NOS ) GO TO 43
      WRITE (6,615) NCD,NTM,NSTD,NA
  615 FORMAT (1H110X5(1H*)*  FATAL ERROR  *5(1H*)
     ,2(/)20X*STUDENT NUMBER OUT OF SEQUENCE*
     ,2(/)20X*LAST CARD READ:  (*I1,I3,I4,7A10,A2*)*)
      GO TO 41
   43 IF ( NTM .EQ. NOT ) GO TO 44
      WRITE (6,614) NCD,NTM,NSTD,NA
  614 FORMAT (1H110X5(1H*)*  FATAL ERROR  *5(1H*)
     ,2(/)20X*TEAM NUMBER OUT OF SEQUENCE*
     ,2(/)20X*LAST CARD READ:  (*I1,I3,I4,7A10,A2*)*)
      GO TO 41
   44 DECODE (72,700,NA) (Q(I),QS(I),QA(I),I=1,12)
  700 FORMAT (12(I3,I1,R1,1X))
      DO 50 I = 1,12
      IF ( Q(I) .EQ. 0 ) GO TO 4
      J = QS(I) + 1
      IF ( J .LE. NIQ .AND. Q(I) .LE. 60 ) GO TO 49
      IF ( NERR .EQ. 0 ) WRITE (6,606)
      NERR = NERR + 1
      WRITE (6,607) NAME,NOS,Q(I),QS(I)
  607 FORMAT (2(/)10X5(1H*)2X*UNDEFINED QUESTION NUMBER - STUDENT *2A10
     ,/20X*STUDENT NUMBER*I5*  QUESTION NUMBER*I5*,*I1
     ,/20X*STUDENT DROPPED FROM REPORT*)
      GO TO 5
   49 DO 51 K = 1,5
      IF ( QA(I) .NE. ANS(K) ) GO TO 51
      QA(I) = K
      GO TO 52
   51 CONTINUE
      IF ( QA(I) .EQ. 1R  ) GO TO 50
      IF ( NERR .EQ. 0 ) WRITE (6,606)
      NERR = NERR + 1
```

```
      N = N + 1
      WRITE (6,608) NAME,NOS,Q(I),QS(I),QA(I)
  608 FORMAT (2(/)10X5(1H*)2X*ERROR IN ANSWER CODE - STUDENT *2A10
     ./20X*STUDENT NUMBER*I5*  QUESTION NUMBER*I5*.*I1*  BAD CODE!  *R1
     ./20X*STUDENT DROPPED FROM REPORT*)
   54 DO 55 K = 1,NC
      SUM(K) = 0
   55 CONTINUE
   56 READ (1,100) NCD,NOT,NOS,NAME
      IF ( EOF(1) .NE. 0. ) GO TO 71
      IF ( NOS .EQ. NSTD ) 56,3
   52 IQ = Q(I)
      IQA = QA(I)
      IF ( W(IQ,J,IQA) .NE. -1 ) GO TO 53
      IF ( NERR .EQ. 0 ) WRITE (6,606)
      NERR = NERR + 1
      WRITE (6,609) NAME,NOS,Q(I),QS(I)
  609 FORMAT (2(/)10X5(1H*)2X*ERROR IN QUESTION NUMBER - WEIGHT WAS NOT
     .BEEN DEFINED*
     ./20X*STUDENT *2A10
     ./20X*STUDENT NUMBER*I5*  BAD QUESTION NUMBER!  *I3*.*I1
     ./20X*STUDENT DROPPED FROM REPORT*)
      GO TO 54
   53 IC = C(IQ,J)
      SUM(IC) = SUM(IC) + W(IQ,J,IQA)
   50 CONTINUE
      GO TO 3
C
C     WRITE THE SCRATCH FILE
C
    4 DO 60 I = 1,NT
      IF ( NOT .NE. TNOS(I) ) GO TO 60
      NOT = I
      GO TO 5
   60 CONTINUE
      IF ( NERR .EQ. 0 ) WRITE (6,606)
      NERR = NERR + 1
      WRITE (6,610) NAME,NOS,NOT
  610 FORMAT (2(/)10X5(1H*)2X*ERROR IN TEAM NUMBER - TEAM IS NOT DEFINED
     .*/20X*STUDENT *2A10*  STUDENT NUMBER *I5*  BAD TEAM NUMBER *I5
     ./20X*STUDENT DROPPED FROM REPORT*)
      DO 61 I = 1,NC
      SUM(I) = 0
   61 CONTINUE
      GO TO 6
    5 WRITE (2) NOS,NAME,NOT,SUM
      NSTUD = NSTUD + 1
      DO 70 I = 1,NC
      RSUM(I) = RSUM(I) + SUM(I)
      SUM(I) = 0
   70 CONTINUE
      IF ( IENDF1 .EQ. 1 ) GO TO 7
    6 IF ( NCD .NE. 1 ) GO TO 2
      NOS = NSTD
      NOT = NTM
      NAME(1) = NA(1)
      NAME(2) = NA(2)
      GO TO 3
    7 REWIND 2
      IF ( NERR .EQ. 0 ) RETURN
      IF ( EFLG .EQ. 0. ) GO TO 8
      WRITE (6,612) NERR
  612 FORMAT (5(/)20XI4*  ERRORS*)
      RETURN
   71 IENDF1 = 1
```

```
  8 WRITE (6,613) NERR
613 FORMAT (5(/)20XI4* ERRORS - FURTHER COMPUTATIONS WOULD GIVE MISLEA
   .DING RESULTS*2(/)30X5(1H*)2X*PROGRAM ABORTED*2X5(1H*))
    CALL REMARK (23H...ERROR LIMIT EXCEEDED)
    CALL EXIT
    END
    SUBROUTINE REPORT (CNAME,TNOS,TNAME,TS,SUM,RSUM,A,NC,NT)
    INTEGER CNAME(NC,2),TNOS(NT),TNAME(NT,2),SUM(NC),A(40,NC)
    INTEGER PAGE
    DIMENSION TS(NC),RSUM(NC),B(40),NAME(2)
    DIMENSION SSUM(7)
    COMMON/WORDS/NSTUD,PSCORE,ITITLE(2),EFLG
C
C   THIS SUBROUTINE GENERATES THE REPORTS
C
    IF ( NSTUD .EQ. 0 ) RETURN
    TSCORE = 0.
    DO 10 I = 1,NC
    RSUM(I) = RSUM(I)/NSTUD
    TSCORE = TSCORE + RSUM(I)
    RSUM(I) = RSUM(I)/TS(I)*100.
    NX = RSUM(I)/2.5
    DO 10 J = 1,40
    A(J,I) = 1R
    IF ( J .GT. NX ) GO TO 10
    A(J,I) = 1RX
    IF ( J.EQ.10.OR.J.EQ.20.OR.J.EQ.30.OR.J.EQ.40) A(J,I) = 1RI
 10 CONTINUE
    CALL DATE (IDATE)
    PAGE = 1
C
C   READ THE SCRATCH FILE
C
  1 READ (2) NOS,NAME,NOT,SUM
    IF ( EOF(2) .NE. 0. ) GO TO 2
    WRITE (6,600) ITITLE,IDATE,PAGE,NAME,(TNAME(NOT,I),I=1,2)
600 FORMAT (1H12(/)45X*REMEDIAL PROCEDURES FOR *2A10,10XA10,5X*PAGE*
   .I4,2(/)18X*STUDENT  *2A10*37X*TEAM  *2A10*
   .3(/)7X*CATEGORY*36X*YOUR SCORE*41X*CLASS SCORE*/
   .24X*PERCENTAGE:  0*7X*25*8X*50*8X*75*8X*100*11X*0*7X*25*8X*50*8X*7
   .5*8X*100*)
    PAGE = PAGE + 1
    STSCORE = 0.
    DO 20 I = 1,NC
    STSCORE = STSCORE + SUM(I)
    SCORE = SUM(I)/TS(I)*100.
    NX = SCORE/2.5
    DO 21 J = 1,40
    B(J) = 1R
    IF ( J .GT. NX ) GO TO 21
    B(J) = 1RX
    IF ( J.EQ.10.OR.J.EQ.20.OR.J.EQ.30.OR.J.EQ.40) B(J) = 1RI
 21 CONTINUE
    WRITE (6,601) (CNAME(I,J),J=1,2),SCORE,B,RSUM(I),(A(J,I),J=1,40)
601 FORMAT (7X2A10,3X*(*F5.1*)*40R1,5X*(*F5.1*)*40R1)
 20 CONTINUE
    WRITE (6,602) STSCORE,TSCORE,PSCORE
602 FORMAT (3(/)42X*-POINTS-*
   .2(/)20X*STUDENT TOTAL:  *5XF7.0,
   .2(/)20X*CLASS AVERAGE:  *5XF7.0,
   .2(/)20X*DELPHI GROUP SCORE:  *F7.0)
    GO TO 1
  2 REWIND 2
    IF ( NC .EQ. 7 ) GO TO 3
    WRITE (6,603)
```

```
     ... NOT ...CLASS SUMMARY CANNOT BE PRODUCED WITH THE PRESENT
    * CODE*)
      RETURN
    3 WRITE (6,604) ITITLE,IDATE,PAGE
  604 FORMAT (1H1 2(/)20X*CLASS SUMMARY*11X*REMEDIAL PROCEDURES FOR *2A10
     *,11XA10,5X*PAGE*I6,4(/)
     *14X*NAME*15X*NUMBER*5X*TEAM NAME*29X*CATEGORY SCORES*22X*TOTAL*/
     *85X*(PER CENT)*22X*(POINTS)*/72X*1*5X*2*5X*3*5X*4*5X*5*5X*6*5X*7*)
      PAGE = PAGE + 1
      NX = 0
    4 READ (2) NOS,NAME,NOT,SUM
      IF ( EOF(2) .NE. 0. ) GO TO 5
      NX = NX + 1
      STSCORE = 0.
      DO 30 I = 1,NC
      STSCORE = STSCORE + SUM(I)
      SSUM(I) = SUM(I)/TS(I)*100.
   30 CONTINUE
      WRITE (6,605) NAME,NOS,(TNAME(NOT,I),I=1,2),SSUM,STSCORE
  605 FORMAT (/9X2A10,3XI5,5X2A10,5X7(F5.1,1X)7XF6.1)
      IF ( NX .EQ. 24 ) 3,4
    5 WRITE (6,606) RSUM,TSCORE,PSCORE
  606 FORMAT (2(/)44X*CLASS AVERAGES:*10X7(F5.1,1X)7XF6.1,
     *2(/)44X*DELPHI GROUP SCORE:  *3XF6.1*  POINTS*)
      END
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HARVEY SIMCASE TEST SCORES
HARVEY SIMCASE 4.9 9.8 HARVEY READS POORLY IN SCHOOL

14060	WECHSLER INTELLIGENCE SCALE FOR CHILDREN		001FULL	120.0	001
	WISC VERBAL 125, WISC PERFORMANCE 110				
01006	WISC INFORMATION		002SS	14.0	002
01006	WISC SIMILARITIES		003SS	15.0	003
01006	WISC COMPREHENSION		004SS	14.0	004
01006	WISC ARITHMETIC		005SS	15.0	005
01006	WISC VOCABULARY		006SS	15.0	006
01006	WISC DIGIT SPAN		007SS	10.0	007
01006	WISC PICTURE COMPLETION		008SS	11.0	008
01006	WISC PICTURE ARRANGEMENT		009SS	12.0	009
01006	WISC BLOCK DESIGN		010SS	9.0	010
01006	WISC OBJECT ASSEMBLY		011SS	12.0	011
01006	WISC CODING		012SS	13.0	012
01006	WISC MAZES		013SS	11.0	013
01060	STANFORD-BINET INTELLIGENCE SCALE		014IQ	120.0	014
13090	ILLINOIS TEST OF PSYCHOLINGUISTIC ABILITIES		015PLA.	10.9	015
01010	ITPA AUDITORY RECEPTION		016AGE.	10.2	016
01010	ITPA VISUAL RECEPTION	SS 34	017AGE	8.8	017
01010	ITPA VISUAL ASSOCIATION	SS 36	018AGE.	10.3	018
01010	ITPA VERBAL EXPRESSION	SS 42	019AGE.	10.9	[illegible]
01010	ITPA MANUAL EXPRESSION	SS 36	020AGE	9.8	[illegible]
01010	ITPA GRAMMATIC CLOSURE	SS44	021AGE.	10.4	021
01010	ITPA VISUAL CLOSURE	SS 30	022AGE	8.0	022
01010	ITPA AUD. SEQUENTIAL MEMORY	SS 40	023AGE.	10.3	023
01010	ITPA VISUAL SEQUENTIAL MEMORY	SS 30	024AGE	6.8	024
01010	ITPA AUDITORY CLOSURE	SS 33	025AGE	7.9	025
01010	ITPA SOUND BLENDING	SS 39	026AGE.	8.6	026
01010	ITPA AUDITORY ASSOCIATION	SS 40	027AGE	10.5	027
19144	DETROIT TESTS OF LEARNING APTITUDE		028N.A.		028
01008	DETROIT PICTURIAL ABSURDITIES		029AGE	8.0	029
01008	DETROIT VERBAL ABSURDITIES		030AGE.	10.0	030
01008	DETROIT PICTURIAL OPPOSITES		031AGE	8.6	031
01008	DETROIT VERBAL OPPOSTIES		032AGE	10.9	032
01008	DETROIT MOTOR SPEED		033AGE	8.0	033
01008	DETROIT AUD. ATTENTION SPAN FOR UNRELATED WORDS		034AGE	10.9	034
01008	DETROIT ORAL COMMISSIONS		035AGE.	8.3	035
01008	DETROIT VISUAL ATTENTION SPAN FOR OBJECTS		036AGE	8.6	036
01008	DETROIT ORIENTATION		037AGE	9.0	037
01008	DETROIT FREE ASSOCIATIONS		038AGE	10.0	038
01008	DETROIT DESIGNS		039AGE	7.3	039
01008	DETROIT AUD. ATTENTION SPAN FOR RELATED SYLLABLES		040AGE	13.6	040
01008	DETROIT NUMBER ABILITIY		041AGE	11.0	041
01008	DETROIT SOCIAL ADJUSTMENT		042AGE	9.3	042
01008	DETROIT VISUAL ATTENTION SPAN FOR LETTERS		043AGE	8.9	043
01008	DETROIT DISARRANGED PICTURES		044AGE	9.0	044
01008	DETROIT ORAL DIRECTIONS		045AGE	11.6	045
01008	DETROIT LIKENESSES AND DIFFERENCES		046AGE	9.6	046
06025	FROSTIG DEVELOPMENTAL TEST OF VISUAL PERCEPTION		047AGE	8.5	047
01006	FROSTIG EYE-MOTOR COORDINATION		048AGE	7.6	048
01005	FROSTIG FIGURE-GROUND PERCEPTION		049AGE	8.3	049
01005	FROSTIG FORM CONSTANCY		050AGE	8.9	050
01004	FROSTIG POSITION IN SPACE		051AGE	8.1	051
01005	FROSTIG SPATIAL RELATIONSHIPS		052AGE	8.7	052
01020	BEERY-BUTENICA DEV TEST-VIS-MOTOR INTEGRATION		053AGE	8.3	053
02010	GOODENOUGH-HARRIS DRAW-A-MAN TEST		054		054
	MAN-SS 82, 12TH O/OILE. WOMAN-SS 75, 5TH O/OILE				
02015	HEATH RAILWALKING TEST		055		055
	1 STD. DEV. BELOW MEAN FOR AGE				
18055	PURDUE PERCEPTUAL MOTOR SURVEY TEST		056	2.0	056
	AWKWARD AND HESITANT				
	PURDUE WALKING BOARD			1.0	

HARVEY SIMCASE 1

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      FEET NOT TOGETHER                                               2.0
PURDUE IDENTIFICATION OF BODY PARTS
      HESITANT                                                        2.
PURDUE OBSTACLE COURSE                                                2.0
PURDUE KRAUS-WEBER                                                    2.0
PURDUE ANGELS-IN-THE-SNOW                                             2.0
      SHADOW MOVEMENTS                                                2.0
PURDUE CHALKBOARD
PURDUE RHYTHMIC WRITING                                               1.0
PURDUE OCULAR PURSUITS                                                2.0
PURDUE VISUAL ACHIEVEMENT                                             3.0
PURDUE IMITATION OF MOVEMENT                                          2.0
      INCONSISTENT                                                    2.0
02005 PURDUE WALKING BOARD                          057               1.0 057
      POOR BALANCE
02005 PURDUE JUMPING                                058               2.0 058
      FEET NOT TOGETHER
02005 PURDUE IDENTIFICATION OF BODY PARTS           059               2.0 059
      HESITANT
01005 PURDUE OBSTACLE COURSE                        060               2.0 060
01005 PURDUE KRAUS-WEBER                            061               2.0 061
02005 PURDUE ANGELS-IN-THE-SNOW                     062               2.0 062
      SHADOW MOVEMENTS
01005 PURDUE CHALKBOARD
01005 PURDUE RHYTHMIC WRITING                       063               1.0 063
01005 PURDUE OCULAR PURSUITS                        064               2.0 064
01005 PURDUE VISUAL ACHIEVEMENT                     065               3.0 065
02005 PURDUE IMITATION OF MOVEMENT                  066               2.0 066
      INCONSISTENT                                  067               2.0 067
06020 PICTURE STORY LANGUAGE TEST                   068N.A.               068
01004 PSLT PRODUCTIVITY-TOTAL WORDS                 069AGE           11.9 069
01004 PSLT PRODUCTIVITY-WORDS PER SENTENCE          070AGE            9.9 070
01004 PSLT PRODUCTIVITY-TOTAL SENTENCES             071AGE           17.5 071
01004 PSLT SYNTAX QUOTIENT                          072AGE            9.3 072
01004 PSLT ABSTRACT-CONCRETE                        073AGE+          17.5 073
01015 PEABODY PICTURE VOCABULARY TEST               074IQ           130.0 074
05015 TEMPLIN-DARLEY TEST OF ARTICULARTION          075                   075
      POOR VOLUNTARY TONGUE ELEVATION, SLOW DIODO-
      CHOKINETIC RATE, SAYS ALL SOUNDS, SOME SOUNDS
      INCONSISTENTLY MISARTICULATED--BLENDS WITH
      S, L, R
04030 WIDE-RANGE ACHIEVEMENT TESTS                  076N.A.               076
01010 WIDE-RANGE SPELLING                           077AGE            7.8 077
01010 WIDE-RANGE ARITHMETIC                         078GRADE          6.5 078
01010 WIDE-RANGE READING                            079AGE            8.1 079
01005 VINELAND SOCIAL MATURITY SCALE                080SQ            95.0 080
11050 GATES-RUSSELL SPELLING DIAGNOSTIC TESTS       081N.A.               081
01005 GATES-RUSSELL SPELLING WORDS ORALLY           082GRADE          2.8 082
01005 GATES-RUSSELL WORD PRONUNCIATION              083GRADE          2.5 083
01005 GATES-RUSSELL GIVING LETTER FOR LETTER SOUND  084GRADE          3.8 084
01005 GATES-RUSSELL SPELLING ONE-SYLLABLE           085GRADE          3.6 085
01005 GATES-RUSSELL SPELLING TWO-SYLLABLES          086GRADE          2.8 086
01005 GATES-RUSSELL WORD REVERSALS                  087GRADE          2.3 087
01000 GATES-RUSSELL SPELLING ATTACK                 088N.A.               088
01000 GATES-RUSSELL AUDITORY DISCRIMINATION         089N.A.               089
01000 GATES-RUSSELL VISUAL-AUDITORY-KINESTHETIC     090N.A.               090
01000 GATES-RUSSELL COMBINED STUDY METHODS          091N.A.               091
24055 GATES-MCKILLOP READING DIAGNOSTIC TESTS       092N.A.               092
14010 GATES-MCKILLOP ORAL READING                   093GRADE          3.3 093
      ANALYSIS OF TOTAL ERRORS
         OMISSIONS, WORDS               20 PERCENT,   MEDIUM
         ADDITIONS, WORDS               20 PERCENT,   MEDIUM
         REPETIONS                       5 PERCENT,   HIGH
         MISPRONUNCIATIONS              55 PERCENT,   LOW
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              FULL REVERSALS                                   MEDIUM
              REVERSAL OF PARTS                                LOW
              TOTAL WRONG ORDER                                MEDIUM
              WRONG BEGINNINGS                                 MEDIUM
              WRONG MIDDLES                                    MEDIUM
              WRONG ENDINGS                                    MEDIUM
              WRONG SEVERAL PARTS                              LOW
01005 GATES-MCKILLOP WORDS-FLASHED PRESENTATION              094GRADE      2.9 094
01005 GATES-MCKILLOP WORDS-UNTIMED PRESENTATION              095GRADE      3.2 095
01005 GATES-MCKILLOP PHRASES-FLASH PRESENTATION              096GRADE      2.8 096
01005 GATES-MCKILLOP KNOWLEDGE OF WORD PARTS                 097LOW            097
01005 GATES-MCKILLOP LETTER SOUNDS                           098NORMAL         098
01005 GATES-MCKILLOP LETTER NAMES                            099NORMAL         099
01005 GATES-MCKILLOP RECOGNIZING VISUAL FORM OF SOUNDS       100NORMAL         100
01005 GATES-MCKILLOP AUDITORY BLENDING                       101NORMAL         101
01000 GATES-MCKILLOP SUPPLEMENTARY TESTS                     102N.A.           102
01015 LINCOLN-OSERETSKY TESTS                                103O/O ILE    7.2 103
03040 GATES-MACGINITIES READING TESTS                        104GRADE      4.7 104
01020 GATES-MACGINITIES VOCABULARY                           105GRADE      4.0 105
01020 GATES-MACGINITIE COMPREHENSION                         106GRADE      5.3 106
05060 METROPOLITAN ACHIEVEMENT TESTS                         107GRADE      4.5 107
01015 MAT WORD KNOWLEDGE                                     108GRADE      4.1 108
01015 MAT WORD DISCRIMINATION                                109GRADE      3.9 109
01015 MAT READING                                            110GRADE      4.9 110
01015 MAT ARITHMETIC CONCEPTS AND SKILLS                     111GRADE      6.0 111
03030 METROPOLITAN ELEMENTARY ARITHMETIC TEST                112GRADE      5.6 112
01015 MEAT ARITHMETIC COMPUTATION                            113GRADE      6.2 113
01015 MEAT PROBLEM SOLVING AND ARITH. CONCEPTS               114GRADE      5.0 114
01010 GILMORE ORAL READING TEST                              115GRADE      3.9 115
15055 DURRELL ANALYSIS OF READING DIFFICULTY                 116N.A.           116
01005 DURRELL ORAL READING                                   117GRADE      3.5 117
01005 DURRELL SILENT READING                                 118GRADE      3.2 118
01005 DURRELL LISTENING                                      119GRADE      6.0 119
01005 DURRELL FLASH                                          120GRADE      3.4 120
01005 DURRELL WORD ANALYSIS                                  121GRADE      3.8 121
01005 DURRELL SPELLING                                       122GRADE      3.5 122
01005 DURRELL HANDWRITING                                    123POOR           123
01005 DURRELL NAMING LETTERS                                 124NORMAL         124
01005 DURRELL VISUAL MEMORY OF WORDS                         125GRADE      2.0 125
01005 DURRELL HEARING SOUNDS IN WORDS                        126GRADE(+)   3.5 126
01005 DURRELL SPELLING-VISUAL MEMORY                         127GRADE(-)   4.0 127
01005 DURRELL SPELLING-PHONICS                               128GRADE      4.5 128
02005 DURRELL SPELLING TEST                                  129GRADE      3.5 129
           ERRORS= BACK/BAKC, TIME/TIEM
01015 GRAY ORAL READING                                      130GRADE      2.3 130
06025 MONROE READING APTITUDE                                131O/O ILE   50.0 131
01005 MONROE VISUAL                                          132O/O ILE   30.0 132
01005 MONROE AUDITORY                                        133C/O ILE   80.0 133
01005 MONROE MOTOR                                           134C/O ILE   20.0 134
01005 MONROE ARTICULATION                                    135C/O ILE   45.0 135
01005 MONROE LANGUAGE                                        136C/O ILE   80.0 136
09040 MEDICAL REPORTS                                        137               137
      PSYCHIATRIC REPORT
            POOR EGO CONTROL, LOW SELF IMAGE,
          TEMPER TANTRUNS
      NEUROLOGICAL REPORT
            SUSPECTED CP AS INFANT, SLIGHT
            NEUROLOGICAL SIGNS
      OPHTHALOGICAL REPORT                                    NORMAL
      EEG REPORT                                              NORMAL
03010 PSYCHIATRIC REPORT                                     138
            POOR EGO CONTROL, LOW SELF IMAGE, TEMPER
            TANTRUMS
03010 NEUROLOGICAL REPORT                                    139               139
            SUSPECTED CP AS INFANT, SLIGHT
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01010 EEG REPORT                                              141NORMAL            141
01010 KEYSTONE VISUAL SCREENING                               142NORMAL            142
01010 AUDIOMETRIC SCREENING                                   143NORMAL            143
01005 SEQUIN FORM BOARD                                       144AGE        8.5   144
01005 KNOX CUBE TEST                                          145AGE        7.5   145
01005 WEPMAN AUDITORY DISCRIMINATION TEST                     1461X ERROR          146
01002 DYNOMOMETER                        LEFT-HANDED          147
03015 LANGUAGE AND SPEECH REPORT                              148                  148
          ORAL MECH. IS SLOW. SPEECH IS FAST AND
          IMPRECISE. AND DIODOCHOKINETIC RATE IS SLOW
01007 BENDER-GESTALT TEST                                     149DA         7.9   149
02007 LATERALITY PREFERENCE TEST                              150                  150
         LEFT HAND AND EAR. RIGHT FOOT AND EYE
05028 PRIMARY MENTAL ABILITIES TEST                           151SCORE    114.0   151
01007 PMA VERBAL MEANINGS                                     152SCORE    135.0   152
01007 PMA SPATIAL RELATIONS                                   153SCORE    105.0   153
01007 PMA PERCEPTUAL SPEED                                    154SCORE     96.0   154
01007 PMA NUMBER FACILITY                                     155SCORE    110.0   155
13005 CASE HISTORY REPORT                                     156                  156
      PRE- AND POST-NATAL HISTORY NORMAL.  NO PREGNANCY
       COMPLICATIONS.  LOW WRITTEN LANGUAGE SKILLS.
       EXTREME HOSTILITY TOWARD YOUNGER SISTER.
       PEDIATRICIAN NOTED UNUSUAL TOE POSITION.  RE-
       FERRAL TO PEDIATRIC NEUROLOGIST, CHILD WAS TOO
       YOUNG TO MAKE A DIAGNOSIS. DOESNT CHEW FOOD
       PROPERLY, JUMBLED SPEECH. BECOMES FURIOUS IF
       ASKED TO REPEAT HIMSELF. NURSERY TEACHER SAID
       CANNOT USE SCISSORS. KDG WORDS POOR.  4TH GRADE
       WAS UNMOTIVATED, RESTLESS, DISINTERESTED IN
       READING.  CANNOT TELL TIME. HOSTILITY AND
         SIBLING RIVALRY REPORTED.  POOR IN SPORTS.
15010 BEHAVIOR RATING SCALE                                   157                  157
       COOPERATION-OFTEN DEMANS SPOT LIGHT, OFTEN
       TALKS OUT OF TURN
       ATTENTION-ATTENDS ADEQUATELY FOR AGE AND GRADE
       ABILITY TO ORGANIZE-OFTEN IS DISORGANIZED IN
       WORK, INEXACT, CARELESS
       ABILITY FOR NEW SITUATIONS-OVERREACTS,
       LACKING IN SELF-CONTROL
       SOCIAL ACCEPTANCE-TOLERATED BY OTHERS
       ACCEPTANCE OF RESPONSIBILITY- AVOIDS RESPON-
       SIBILITY. LIMITED ROLE ACCEPTANCE
       COMPLETION OF ASSIGNMENTS-SELDOM FINISHES EVEN
       WITH GUIDANCE
       TACTFULNESS--USUALLY DISREGARDS OTHERS
       FEELINGS
04015 INFORMAL READING INVENTORY                              158                  158
      INDEPENDENT LEVEL                                           GRADE      4.1
      INSTRUCTIONAL LEVEL                                         GRADE      5.3
      FRUSTRATION LEVEL                                           GRADE      6.9
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SALLY SIMCASE TEST SCORES
SALLY SIMCASE 3.1 8.0 READING PROBLEMS IN SCHOOL

14000	WECHSLER INTELLIGENCE SCALE FOR CHILDRE.		001FULL	102.0
	WISC VERBAL 86. WISC PERFORMANCE ...			
1006	WISC INFORMATION		002SS	7.0
01006	WISC SIMILARITIES		003SS	10.0
01006	WISC COMPREHENSION		004SS	12.0
01006	WISC ARITHMETIC		005SS	8.0
01006	WISC VOCABULARY		006SS	6.0
01006	WISC DIGIT SPAN		007SS	5.0
01006	WISC PICTURE COMPLETION		008SS	10.0
01006	WISC PICTURE ARRANGEMENT		009SS	13.0
01006	WISC BLOCK DESIGN		010SS	15.0
01006	WISC OBJECT ASSEMBLY		011SS	17.0
01006	WISC CODING		012SS	9.0
01006	WISC MAZES		013SS	11.0
02000	STANFORD-BINET INTELLIGENCE SCALE		014IQ	91.0
	M.A. 8.0			
14090	ILLINOIS TEST OF PSYCHOLINGUISTIC ABILITIES		015PLA	7.8
	MEAN SCALED SCORE 31.9			
01010	ITPA AUDITORY RECEPTION	SS 31	016AGE	8.0
01010	ITPA VISUAL RECEPTION	SS 30	017AGE	9.3
01010	ITPA VISUAL ASSOCIATION	SS 40	018AGE	10.3
01010	ITPA VERBAL EXPRESSION	SS 27	019AGE	6.4
01010	ITPA MANUAL EXPRESSION	SS 35	020AGE	8.7
01010	ITPA GRAMMATIC CLOSURE	SS 18	021AGE	6.5
01010	ITPA VISUAL CLOSURE	SS 36	022AGE	9.0
01010	ITPA AUD. SEQUENTIAL MEMORY	SS 31	023AGE	6.6
01010	ITPA VISUAL SEQUENTIAL MEMORY	SS 42	024AGE+	10.5
01010	ITPA AUDITORY CLOSURE	SS 24	025AGE	5.9
01010	ITPA SOUND BLENDING	SS 28	026AGE	6.8
01010	ITPA AUDITORY ASSOCIATION	SS 23	027AGE	6.8
19144	DETROIT TESTS OF LEARNING APTITUDE		028M.A.	8.2
01008	DETROIT PICTURIAL ABSURDITIES		029AGE	8.9
01008	DETROIT VERBAL ABSURDITIES		030AGE	6.0
01008	DETROIT PICTURIAL OPPOSITES		031AGE	9.5
01008	DETROIT VERBAL OPPOSTIES		032AGE	8.6
01008	DETROIT MOTOR SPEED		033AGE	8.9
01008	DETROIT AUD. ATTENTION SPAN FOR UNRELATED WORDS		034AGE	8.2
01008	DETROIT ORAL COMMISSIONS		035AGE	6.0
01008	DETROIT VISUAL ATTENTION SPAN FOR OBJECTS		036AGE	10.1
01008	DETROIT ORIENTATION		037AGE	8.9
01008	DETROIT FREE ASSOCIATIONS		038AGE	7.9
01008	DETROIT DESIGNS		039AGE	13.0
01008	DETROIT AUD. ATTENTION SPAN FOR RELATED SYLLABLES		040AGE	3.6
01008	DETROIT NUMBER ABILITIY		041AGE	8.9
01008	DETROIT SOCIAL ADJUSTMENT		042AGE	7.3
01008	DETROIT VISUAL ATTENTION SPAN FOR LETTERS		043AGE	9.9
01008	DETROIT DISARRANGED PICTURES		044AGE	9.6
01008	DETROIT ORAL DIRECTIONS		045AGE	7.9
01008	DETROIT LIKENESSES AND DIFFERENCES		046AGE	8.9
06025	FROSTIG DEVELOPMENTAL TEST OF VISUAL PERCEPTION		047AGE	9.3
01006	FROSTIG EYE-MOTOR COORDINATION		048AGE	9.2
01005	FROSTIG FIGURE-GROUND PERCEPTION		049AGE	9.1
01005	FROSTIG FORM CONSTANCY		050AGE	9.2
01004	FROSTIG POSITION IN SPACE		051AGE	9.1
01005	FROSTIG SPATIAL RELATIONSHIPS		052AGE	9.5
01020	BEERY-BUTENICA DEV TEST-VIS-MOTOR INTEGRATION		053AGE	10.2
02010	GOODENOUGH-HARRIS DRAW-A-MAN TEST		054M.A.	9.0
	SCALED SCORE 103. FIGURE WAS EXTREMELY SMALL		055	
02015	HEATH RAILWALKING TEST			
	PERFORMED WITHIN ONE S.D. ABOVE MEAN			
19055	PURDUE PERCEPTUAL MOTOR SURVEY TEST		056LEVEL	3.0
	SHADOW MOVEMENTS OBSERVED ON RIGHT SIDE WHEN			

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SALLY SIMCASE 2.

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        LEVELS = POOREST 1, BEST 4
    5 PURDUE WALKING BOARD                                    057LEVEL     3.0
        FALLS OFF SIDE WHEN BEGINNING WITH RIGHT FOOT
    5 PURDUE JUMPING                                          058LEVEL     2.0
        FALLS WHEN HOPPING ON RIGHT FOOT
01005 PURDUE IDENTIFICATION OF BODY PARTS                     059LEVEL     3.0
01005 PURDUE OBSTACLE COURSE                                  060LEVEL     4.0
01005 PURDUE KRAUS-WEBER                                      061LEVEL     3.0
02005 PURDUE ANGELS-IN-THE-SNOW                               062LEVEL     2.0
        SHADOW MOVEMENTS WITH RIGHT LEG AND ARM
02005 PURDUE CHALKBOARD                                       063LEVEL     3.0
        POORLY CONTROLLED CIRCLES WITH RIGHT HAND
01005 PURDUE RHYTHMIC WRITING                                 064LEVEL     3.0
01005 PURDUE OCULAR PURSUITS                                  065LEVEL     3.0
01005 PURDUE VISUAL ACHIEVEMENT                               066LEVEL     4.0
01005 PURDUE IMITATION OF MOVEMENT                            067LEVEL     3.0
06020 PICTURE STORY LANGUAGE TEST                             068
01004 PSLT PRODUCTIVITY-TOTAL WORDS                           069AGE       6.5
01004 PSLT PRODUCTIVITY-WORDS PER SENTENCE                    070AGE       6.7
01004 PSLT PRODUCTIVITY-TOTAL SENTENCES                       071AGE       6.7
01004 PSLT SYNTAX QUOTIENT                                    072AGE       6.5
01004 PSLT ABSTRACT-CONCRETE                                  073AGE       8.0
02015 PEABODY PICTURE VOCABULARY TEST                         074IQ      102.0
        M.A. = 8.9
05015 TEMPLIN-DARLEY TEST OF ARTICULARTION                    075
        OCCASIONAL SUBSTITUTIONS  INITIAL, MIDDLE +
        FINAL POSITIONS,   T FOR K  OTAY(CKAY) ,
        F FOR TH  CAFFY(CATHY)
        CAPABLE OF MAKING ALL SOUNDS IN ISOLATION
06030 WIDE-RANGE ACHIEVEMENT TESTS                            076
02010 WIDE-RANGE SPELLING                                     077GRADE     1.6
        AN(AND), CAD(CAT), CO(GO)
01010 WIDE-RANGE ARITHMETIC                                   078GRADE     3.2
02010 WIDE-RANGE READING                                      079GRADE     1.7
        OMISSIONS = WAS, WORK, HOW
 5005 VINELAND SOCIAL MATURITY SCALE                          080SQ       84.0
        SOCIAL AGE 7-4.  SAT UP AT 6 MONTHS, WALKED AT
        12 MONTHS, 1ST WORD AT 3 YEARS, 1ST SENTENCE AT
        4 YEARS, SOCIAL MATURITY SCORE LOWERED BECAUSE
        OF COMMUNICATION ITEMS.
15060 GATES-RUSSELL SPELLING DIAGNOSTIC TESTS                 081
 2005 GATES-RUSSELL SPELLING WORDS ORALLY                     082GRADE     1.6
        ERRORS = NIM(VINE), BUT(BUD), OO(TO)
01005 GATES-RUSSELL WORD PRONUNCIATION                        083GRADE     1.8
01005 GATES-RUSSELL GIVING LETTER FOR LETTER SOUND            084GRADE     1.8
01005 GATES-RUSSELL SPELLING ONE-SYLLABLE                     085GRADE     1.8
01005 GATES-RUSSELL SPELLING TWO-SYLLABLES                    086GRADE     2.1
01005 GATES-RUSSELL WORD REVERSALS                            087GRADE     2.0
01005 GATES-RUSSELL SPELLING ATTACK                           088GRADE
02005 GATES-RUSSELL AUDITORY DISCRIMINATION                   089
        DID POORLY
 2003 GATES-RUSSELL VISUAL-AUDITORY-KINESTHETIC               090
        BEST ON VISUAL AND KINESTHETIC METHODS.
 2005 GATES-RUSSELL COMBINED STUDY METHODS                    091
        SEEMED TO BE CONFUSED
33055 GATES-MCKILLOP READING DIAGNOSTIC TESTS                 092
14010 GATES-MCKILLOP ORAL READING                             093GRADE     1.7
        L RATING = LOW SCORE, MORE THAN AVERAGE NUMBER
                   ERRORS OF THAT TYPE
        M RATING = MEDIAN SCORE, AVERAGE NUMBER ERRORS
                   OF THAT TYPE
        H RATING = HIGH SCORE, LESS THAT AVERAGE
                   NUMBER ERRORS OF THAT TYPE
        ANALYSIS OF TOTAL ERRORS
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            ADDITIONS, WORDS          1 O/O  M
            REPETITIONS               2 O/O  M
            MISPRONUNCIATIONS        42 O/O  M
        ANALYSIS OF MISPRONUNCIATIONS
            WRONG SEVERAL PARTS 100 O/O  L
01005 GATES-MCKILLOP WORDS-FLASHED PRESENTATION      094GRADE    2.3
01005 GATES-MCKILLOP WORDS-UNTIMED PRESENTATION      095GRADE    1.6
01005 GATES-MCKILLOP PHRASES-FLASH PRESENTATION      096GRADE    1.8
 2005 GATES-MCKILLOP KNOWLEDGE OF WORD PARTS         097
        RECOGNIZING AND BLENDING                        GRADE    2.0
01005 GATES-MCKILLOP LETTER SOUNDS                   098GRADE    2.2
01005 GATES-MCKILLOP LETTER NAMES                    099GRADE    2.7
 5005 GATES-MCKILLOP RECOGNIZING VISUAL FORM OF SOUNDS 100
        NONSENSE WORDS                                  GRADE    3.0
        INITIAL LETTERS                                 GRADE    2.7
        FINAL LETTERS                                   GRADE    2.2
        VOWELS                                          GRADE    1.6
01005 GATES-MCKILLOP AUDITORY BLENDING               101GRADE    1.7
 5000 GATES-MCKILLOP SUPPLEMENTARY TESTS             102
        SPELLING                                        GRADE    1.6
        ORAL VOCABULARY                                 GRADE    2.5
        SYLLABICATION                                   GRADE    2.3
        AUDITORY DISCRIMINATION      POOR
 4015 LINCOLN-OSERETSKY TESTS                        1030/0 ILE  50.0
        AVERAGE FOR AGE OR BETTER IN GENERAL OR GROSS
        AND FINE MOTOR TESTS.  SLIGHT DIFFICULTY IN
        SIMULTANEOUS MOVEMENT.
05040 GATES-MACGINITIES READING TESTS                104GRADE    2.2
        WORKED VERY FAST. FINISHED BEFORE TIME LIMIT.
        DID NOT WISH TO GO BACK TO CHECK ANSWERS
01020 GATES-MACGINITIES VOCABULARY                   105GRADE    2.0
01020 GATES-MACGINITIE COMPREHENSION                 106GRADE    2.1
05045 METROPOLITAN ACHIEVEMENT TESTS                 107
01015 MAT WORD KNOWLEDGE                             108GRADE    2.1
01300                                                109
01315 MAT READING                                    110GRADE    2.1
01015 MAT ARITHMETIC CONCEPTS AND SKILLS             111GRADE    3.0
03030 METROPOLITAN ELEMENTARY ARITHMETIC TEST        112GRADE    3.2
01015 MEAT ARITHMETIC COMPUTATION                    113GRADE    3.5
01015 MEAT PROBLEM SOLVING AND ARITH. CONCEPTS       114GRADE    3.0
04010 GILMORE ORAL READING TEST                      115
      ACCURACY                                          GRADE    2.1
      COMPREHENSION                                     GRADE    2.6
      RATE                                              GRADE    1.9
16005 DURRELL ANALYSIS OF READING DIFFICULTY         116
 2005 DURRELL ORAL READING                           117GRADE    1.8
        MAJOR ERROR = OMISSIONS OF WAS, CAN, AND IS
01005 DURRELL SILENT READING                         118GRADE    1.7
01005 DURRELL LISTENING                              119GRADE    2.4
01005 DURRELL FLASH                                  120GRADE    2.3
01005 DURRELL WORD ANALYSIS                          121GRADE    1.9
01005 DURRELL SPELLING                               122GRADE(-) 2.0
01005 DURRELL HANDWRITING                            123GRADE    3.0
01005 DURRELL NAMING LETTERS                         124
01005 DURRELL VISUAL MEMORY OF WORDS                 125GRADE    2.9
01005 DURRELL HEARING SOUNDS IN WORDS                126GRADE    1.8
01005 DURRELL SPELLING-VISUAL MEMORY                 127GRADE(-) 4.0
01005 DURRELL SPELLING-PHONICS                       128GRADE(-) 4.0
02005 DURRELL SPELLING TEST                          129GRADE(-) 2.0
        ERRORS = WAH(WERE), BACH(BAT), CALL(ALL)
02015 GRAY ORAL READING                              130GRADE    1.3
        COMPREHENSION WAS FAIR
06025 MONROE READING APTITUDE                        131
01005 MONROE VISUAL                                  1320/0 ILE  61.0
01005 MONROE AUDITORY                                1330/0 ILE  22.0
01005 MONROE MOTOR                                   1340/0 ILE  50.0
01005 MONROE ARTICULATION                            1350/0 ILE  48.0
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A49

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                                                   1. 0/0 ILE   45.0
  5 MONROE LANGUAGE                               1360/0 ILE   10.0
  3 MEDICAL REPORTS                               137
  0 PSYCHIATRIC REPORT                            138
       WEAK EGO. NO FRIENDS. EVIDENCE OF ANXIETY.
       OVERDEPENDENCE ON PARENTS, PARTICULARLY MOTHER.
       OVERWEIGHT. MILD NEURODERMATITIS (SKIN RASH
       OF NEUROLOGICAL ORIGIN). UNFILLED DEPENDENCY
       NEEDS AND INABILITY TO MEET RESPONSIBILITIES
       OF GROWING UP. TENDENCY TO WITHDRAW FROM
       OTHERS. FEELINGS OF ANGER EXPRESSED OVERTLY.
       PARENTS DISAPPOINTED IN LACK OF SCHOOL PROGRES
       S, CAUSE OF MARITAL DISCORD.
06010 NEUROLOGICAL REPORT                         139
       NO OVERT NEUROLOGICAL ABNORMALITIES. CRANICAL
       NERVES INTACT. REFLEXES WITHIN NORMAL LIMITS.
       MUSCLE TONE NORMAL. EVIDENCE OF SOFT SIGNS OF
       NEUROLOGICAL  DYSFUNCTION.
       RX.  RITALIN -- 5 MG. 2 TIMES DAILY
03010 OPHTHALOGICAL REPORT                        140
       NORMAL VISUAL ACUITY.  20/20 DISTANT VISION.
       NO ORGANIC ABNORMALITIES NOTED IN EYE.
04010 EEG REPORT                                  141
       POSITIVE SPIKE PATTERN (6-7/SEC AND 14/SEC)
       SLOW POSTERIOR TEMPERAL WAVE ACTIVITY NOTED
       INTERPRETED AS WITHIN NORMAL LIMITS.
04010 KEYSTONE VISUAL SCREENING                   142
       DOUBTFUL AREA IN FUSION AND LATERAL POSTURE
       AT NEAR POINT. ALL OTHER TESTS WITHIN NORMAL
       LIMITS.
03010 AUDIOMETRIC SCREENING                       143
       25 DB. AT 500, 200, 4000, 8000 FR.
       WITHIN NORMAL LIMITS.
01005 SEGUIN FORM BOARD                           144AGE       11.4
01005 KNOX CUBE TEST                              145AGE       15.5
02005 WEPMAN AUDITORY DISCRIMINATION TEST         146
       7X ERRORS. ABOVE AGE LIMIT.
  J02 DYNOMOMETER                                 147
       RIGHT HAND - AGE 7,  LEFT HAND - AGE 9.
06015 LANGUAGE AND SPEECH REPORT                  148
       SPEAKS SLOWLY. USES SINGLE WORDS OR SHORT
       PHRASES. EVIDENCE OF DYSNOMIA. DIFFICULTY IN
       RETREIVING WORDS. CIRCUMLOCUTION. SYNTACTIC
       ERRORS.  1ST WORD AT AGE 3.6, 1ST SENT AGE 4.0,
       OCCASIONAL SUBSTITUTIONS NOTED IN ARTICULAT.
02007 BENDER-GESTALT TEST                         149DA        9.8
       VERY SMALL FIGURES. FIGURES WELL ORGANIZED.
05007 LATERALITY PREFERENCE TEST                  150
       LEFT HAND WRITING
       RIGHT FOOT KICKING
       LEFT EYE SIGHTING
       RIGHT EAR LISTENING TO WATCH
05028 PRIMARY MENTAL ABILITIES TEST               151IQ       104.0
01007 PMA VERBAL MEANINGS                         152IQ        80.0
01007 PMA SPATIAL RELATIONS                       153IQ       121.0
01007 PMA PERCEPTUAL SPEED                        154IQ        95.0
01007 PMA NUMBER FACILITY                         155IQ       112.0
13005 CASE HISTORY REPORT                         156
       MOTHER HAD MANY MISCARRIAGES. BIRTH WAS PRE-
       MATURE. BIRTH WEIGHT WAS 5-6. ALLERGIC TO COWS
       MILK. DIFFICULT BABY WITH MUCH CRYING. MANY
       EAR INFECTIONS. TONSILS AND ADANOIDS OUT AT
       3-4 (WERE INTERFERRING WITH HEARING). EARLY
       MOTOR DEV. WAS NORMAL.  1ST WORD AT 3 6, BEGAN
       SPEAKING 4 YRS.  ENJOYS PUZZLES, RIDING BIKE.
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KDG= NOT LEARN RHYMNS, ALPHABET, ADDRESS OR PHONE NUMBER. 1ST GRADE= NOT PAY ATTENTION OR COMPLETE WORK. 2ND GRADE= POOR IN PHONICS AND READING. NOT LIKED BY CLASSMATES.

07010 BEHAVIOR RATING SCALE 157

1 = VERY POOR, 3 = AVG., 5 = SUPERIOR
AUDITORY COMPREHENSION = 2
SPOKEN LANGUAGE = 1
ORIENTATION = 3
BEHAVIOR = 3
MOTOR = 4

05015 INFORMAL READING INVENTORY 158

INDEPENDENT LEVEL	PREPRIMER	GRADE	
INSTRUCTIONAL LEVEL	PRIMER	GRADE	
FRUSTRATION LEVEL		GRADE	2.0
LISTENING LEVEL		GRADE	3.0

05010 ORAL MECHANISM EXAM 159

SOME DIFFICULTY IN LATERALIZING TONGUE TO LEFT WITH VERBAL CUES. DIFFICULTY NOT NOTED IN VEGATATIVE MOVEMENT. NOT OTHER ORAL MECHANISM DIFFICULTIES NOTED.

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GEORGE SIMCASE TEST SCORES
GEORGE SIMCASE   1-3  7-4 PARENTS WORRIED--RETAINED IN KDG.
DOES NOT PLAY WELL. IS RESTLESS AND DISRUPTING DURING STORY HOUR.
1406 WECHSLER INTELLIGENCE SCALE FOR CHILDREN              001FULL    93
     WISC VERBAL 71 . WISC PERFORMANCE 121
                                                           00255      7
 [illegible] WISC INFORMATION                              00355      7
 01006 WISC SIMILARITIES                                   0045[illegible]  5
 [illegible] WISC COMPREHENSION                            00555      4
 01006 WISC ARITHMETIC                                     00655      4
 [illegible] WISC VOCABULARY                               00755      5
 [illegible] WISC DIGIT SPAN                               0085S      1[illegible]
 [illegible] WISC PICTURE COMPLETION                       00955      13
 [illegible] WISC PICTURE ARRANGEMENT                      01055      13
 [illegible] WISC BLOCK DESIGN                             01155      14
 [illegible] WISC OBJECT ASSEMBLY                          01255      5
 [illegible] WISC CODING                                   01355      14
 [illegible] WISC MAZES                                    01415      89
 [illegible] STANFORD-BINET INTELLIGENCE SCALE
      STANFORD-BINET [illegible]
 [illegible] ILLINOIS TEST OF PSYCHOLINGUISTIC ABILITIES   015PLA     7-1
 [illegible] ITPA AUDITORY RECEPTION          5527         016AGE     5-4
 [illegible] ITPA VISUAL RECEPTION            5541         017AGE     5-5
 01[illegible] ITPA VISUAL ASSOCIATION        5546         018AGE     1[illegible]-3
 [illegible] ITPA VERBAL EXPRESSION           5526         019AGE     5-0
 [illegible] ITPA MANUAL EXPRESSION           5542         020AGE     9-10
 [illegible] ITPA GRAMMATIC CLOSURE           5519         021AGE     5-0
 [illegible] ITPA VISUAL CLOSURE              5542         022AGE     6-7
 [illegible] ITPA AUD. SEQUENTIAL MEMORY      5528         023AGE     4-10
 [illegible] ITPA VISUAL SEQUENTIAL MEMORY    5543         024AGE     9-9
 [illegible] ITPA AUDITORY CLOSURE            55[illegible]  025AGE     4-0
 [illegible] ITPA SOUND BLENDING              5526         026AGE     5-[illegible]
 [illegible] ITPA AUDITORY ASSOCIATION        5528         027AGE     5-6
 1914[illegible] DETROIT TESTS OF LEARNING APTITUDE        028MA      6-7
 [illegible] DETROIT PICTORIAL ABSURDITIES                 029AGE     7-10
 [illegible] DETROIT VERBAL ABSURDITIES                    030AGE     5-5
 [illegible] DETROIT PICTORIAL OPPOSITES                   031AGE     6-1
 [illegible] DETROIT VERBAL OPPOSITES                      032AGE     5-3
 [illegible] DETROIT MOTOR SPEED                           033AGE     7-5
 [illegible] DETROIT AUD. ATTENTION SPAN FOR UNRELATED WORDS 034AGE   5-2
 [illegible] DETROIT ORAL COMMISSIONS                      035AGE     4-6
 [illegible] DETROIT VISUAL ATTENTION SPAN FOR OBJECTS     036AGE     5-2
 [illegible] DETROIT ORIENTATION                           037AGE     7-5
 [illegible] DETROIT FREE ASSOCIATIONS                     038AGE     6-1
 [illegible] DETROIT DESIGNS                               039AGE     5-4
 [illegible] DETROIT AUD. ATTENTION SPAN FOR RELATED SYLLABLES 040AGE 5-9
 [illegible] DETROIT NUMBER ABILITY                        041AGE     7-10
 [illegible] DETROIT SOCIAL ADJUSTMENT                     042AGE     7-2
 [illegible] DETROIT VISUAL ATTENTION SPAN FOR LETTERS     043AGE     7-5
 [illegible] DETROIT DISARRANGED PICTURES                  044AGE     6-6
 [illegible] DETROIT ORAL DIRECTIONS                       045AGE     5-9
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[illegible]	DETROIT LIKENESSES AND DIFFERENCES	046AGE	5-2
[illegible]	FROSTIG DEVELOPMENTAL TEST OF VISUAL PERCEPTION	047AGE	[illegible]
[illegible]	FROSTIG EYE-MOTOR COORDINATION	048AGE	6-7
[illegible]	FROSTIG FIGURE-GROUND PERCEPTION	049AGE	6-6
[illegible]	FROSTIG FORM CONSTANCY	050AGE	6-5
[illegible]	FROSTIG POSITION IN SPACE	051AGE	[illegible]
[illegible]	FROSTIG SPATIAL RELATIONSHIPS	052AGE	6-9
[illegible]	BEERY-BUKTENICA DEV TEST-VIS-MOTOR INTEGRATION	053AGE	6-4
[illegible]	GOODENOUGH-HARRIS DRAW-A-MAN TEST	054STD SCR	110
	ENJOYED MAKING THE DRAWING — FIRM LINES		
C2015	HEATH RAILWALKING TEST	055	
	WITHIN ONE STANDARD DEVIATION ABOVE MEAN FOR AGE		
[illegible]	PURDUE PERCEPTUAL MOTOR SURVEY TEST	056	
	RATING SCALE 1-4 LOW (1) HIGH (4)		
[illegible]	PURDUE WALKING BOARD	057RATING	4
[illegible]	PURDUE JUMPING	058RATING	4
[illegible]	PURDUE IDENTIFICATION OF BODY PARTS	059RATING	3
[illegible]	PURDUE OBSTACLE COURSE	060RATING	4
[illegible]	PURDUE KRAUS-WEBER	061RATING	3
[illegible]	PURDUE ANGELS-IN-THE-SNOW	062RATING	4
[illegible]	PURDUE CHALKBOARD	063RATING	[illegible]
[illegible]	PURDUE RHYTHMIC WRITING	064RATING	2
[illegible]	PURDUE OCULAR PURSUITS	065RATING	3
[illegible]	PURDUE VISUAL ACHIEVEMENT	066RATING	3.
[illegible]	PURDUE IMITATION OF MOVEMENT	067RATING	4
[illegible]	PICTURE STORY LANGUAGE TEST	068	
	A-6 REPRESENTS THE LOWEST POSSIBLE SCORE		
[illegible]	PSLT PRODUCTIVITY-TOTAL WORDS	069AGE	6-5
[illegible]	PSLT PRODUCTIVITY-WORDS PER SENTENCE	070AGE	6-5
[illegible]	PSLT PRODUCTIVITY-TOTAL SENTENCES	071AGE	[illegible]
[illegible]	PSLT SYNTAX QUOTIENT	072AGE	6-5
[illegible]	PSLT ABSTRACT-CONCRETE	073AGE	6-7
[illegible]	PEABODY PICTURE VOCABULARY TEST [illegible] 6-1	074IQ	67
13015	TEMPLIN-DARLEY TEST OF ARTICULATION	075	
	[illegible] SUBSTITUTIONS FOR [illegible] AND [illegible] DIFFICULTY IN		
	SEQUENCING [illegible] SOUNDS AND NUMBERS		
[illegible]	WIDE-RANGE ACHIEVEMENT TESTS	076	
[illegible]	WIDE-RANGE SPELLING	077AGE	1-2
[illegible]	WIDE-RANGE ARITHMETIC	078AGE	2-1
[illegible]	WIDE-RANGE READING	079AGE	[illegible]
[illegible]	VINELAND SOCIAL MATURITY SCALE	080SQ	90
1206	GATES-RUSSELL SPELLING DIAGNOSTIC TESTS	081	
[illegible]	GATES-RUSSELL SPELLING WORDS ORALLY	082GRADE(-)1.6	
[illegible]	GATES-RUSSELL WORD PRONUNCIATION	083GRADE	1.4
[illegible]	GATES-RUSSELL GIVING LETTER FOR LETTER SOUND	084GRADE	1.6
[illegible]	GATES-RUSSELL SPELLING ONE-SYLLABLE	085GRADE	1.0
[illegible]	GATES-RUSSELL SPELLING TWO-SYLLABLES	086GRADE(-)1.0	
[illegible]	GATES-RUSSELL WORD REVERSALS	087GRADE	1.4
[illegible]	GATES-RUSSELL SPELLING ATTACK	088GRADE	POOR
[illegible]	GATES-RUSSELL AUDITORY DISCRIMINATION	089GRADE	POOR
[illegible]	GATES-RUSSELL VISUAL-AUDITORY-KINESTHETIC	090GRADE	POOR
[illegible]	GATES-RUSSELL COMBINED STUDY METHODS	091GRADE	
	NO SCORE OBTAINED		
30055	GATES-MCKILLOP READING DIAGNOSTIC TESTS	092	
[illegible]	GATES-MCKILLOP ORAL READING (AGE- 6-10)	093GRADE	1.6

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L RATING = LOW SCORE, MORE THAN AVERAGE NUMBER
           ERRORS OF THAT TYPE
M RATING = MEDIAN SCORE, AVERAGE NUMBER ERRORS
           OF THAT TYPE
H RATING = HIGH SCORE, LESS THAN AVERAGE
           NUMBER ERRORS OF THAT TYPE
 ANALYSIS OF TOTAL ERRORS
      OMISSIONS, WORDS                                         55L
      ADDITIONS, WORDS                                         11 M
      REPETITIONS                                              2 M
      MISPRONUNCIATIONS                                        42 M
 ANALYSIS OF MISPRONUNCIATIONS                                 420/0
1  5 GATES-MCKILLOP WORDS-FLASHED PRESENTATION      094GRADE   1.7
1  5 GATES-MCKILLOP WORDS-UNTIMED PRESENTATION      095GRADE   1.4
   5 GATES-MCKILLOP PHRASES-FLASH PRESENTATION      096GRADE   1.5
   5 GATES-MCKILLOP KNOWLEDGE OF WORD PARTS         097
     NO SCORE OBTAINED
02   5 GATES-MCKILLOP LETTER SOUNDS                 098
     MISSED 10 LETTERS
   5 GATES-MCKILLOP LETTER NAMES                    099
     MISSED 5 LETTERS
   5 GATES-MCKILLOP RECOGNIZING VISUAL FORM OF SOUNDS 100      POOR
   5 GATES-MCKILLOP AUDITORY BLENDING                101       POOR
   5 GATES-MCKILLOP SUPPLEMENTARY TESTS              102
     SPELLING                                         GRADE(-)1.6
     ORAL VOCABULARY                                  GRADE(-)2.3
     SYLLABICATION                                    GRADE    1.0
     AUDITORY DISCRIMINATION                          POOR
     LINCOLN-OSERETSKY TESTS                        103D/O ILE 63
     AVERAGE FOR AGE OR BETTER IN FINE AND GROSS MOTOR
     GATES-MACGINITIES READING TESTS                104GRADE
 1   GATES MACGINITIES VOCABULARY                   105GRADE   1.4
     GATES-MACGINITIES COMPREHENSION                106GRADE   1.2
     SEEMED TO GUESS AT MANY ANSWERS
     METROPOLITAN ACHIEVEMENT TESTS                 107
     MAT WORD KNOWLEDGE                             108GRADE   1.5
     MAT WORD DISCRIMINATION                        10
     MAT READING                                    110GRADE   1.4
     MAT ARITHMETIC CONCEPTS AND SKILLS             111GRADE   1.3
     METROPOLITAN ELEMENTARY ARITHMETIC TEST        112GRADE
     MEAT ARITHMETIC COMPUTATION                    113GRADE   1.7
     MEAT PROBLEM SOLVING AND ARITH. CONCEPTS       114GRADE   1.4
 4   GILMORE ORAL READING TEST                      115GRADE
                          ACCURACY                     GRADE   1.5
                          COMPREHENSION                GRADE   1.2
                          RATE                         GRADE   1.4
     DURRELL ANALYSIS OF READING DIFFICULTY          1.0
   5 DURRELL ORAL READING                           117GRADE   1.1
     NOTATION-COMPLETE INABILITY TO ATTACH WORDS.
          INSECURE.
          POOR COMPREHENSION.
     DURRELL SILENT READING                         118GRADE   1.1
     POOR COMPREHENSION.
   5 DURRELL LISTENING                              119GRADE   1.3
     POOR COMPREHENSION.
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[illegible] DURRELL FLASH                                  120GRADE    [illegible]
[illegible] DURRELL WORD ANALYSIS                          121GRADE    [illegible]
[illegible] DURRELL SPELLING                               122GRADE(-12.0
[illegible] DURRELL HANDWRITING                            123GRADE    2.0
[illegible] DURRELL NAMING LETTERS                         124
        ANY ERRORS IN NAMING BOTH CAPITALS AND
        SMALL LETTER.
[illegible] DURRELL VISUAL MEMORY OF WORDS                 [illegible]
[illegible] DURRELL HEARING SOUNDS IN WORDS                126GRADE(-1)[illegible]
[illegible] DURRELL SPELLING-VISUAL [illegible]            127
        INTERMEDIATE [illegible] NOT APPROPRIATE.
[illegible] DURRELL SPELLING-PHONICS                       128
        INTERMEDIATE [illegible] NOT APPROPRIATE.
[illegible] DURRELL SPELLING TEST                          129GRADE(-12.0
[illegible] GRAY ORAL READING                              130GRADE    [illegible]
[illegible]
[illegible]                                                131
[illegible]                                                132
[illegible]                                                133
[illegible]                                                134
[illegible]                                                135
[illegible]                                                136
[illegible]                                                137
[illegible]                                                138
[illegible]                                                139
[illegible]                                                140
[illegible]                                                141
[illegible]                                                142
[illegible]                                                143
[illegible]                                                144AGE
[illegible]                                                145AGE
[illegible]                                                146
[illegible]                                                147
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[illegible] LAN [illegible] AND SPEECH REPORT 14[illegible]
[illegible] BABBLED AT 4 MO. SINGLE WORDS--2YRS
SENTENCES--4 1/2 YRS. UNDERSTOOD SINGLE WORDS
AND SIMPLE COMMANDS--PROBLEMS WITH COMPLEX
INSTRUCTIONS. DYSNOMIA. INAPPROPRIATE VERBAL
RESPONSES. VERBAL DISINHIBITION. SEVERE FORM-
ULATION PROBLEMS. ARTICULATION DIFFICULTIES WITH
(R) AND (L)
[illegible] 7 [illegible] TEST 14[illegible] 7.0
[illegible] REACHED LIMIT OF SUPPITE SCORING [illegible]
WELL ORGANIZED DESIGNS--GOOD ORDER. WITHIN TIME
LIMIT FOR AGE
[illegible] LATERALITY PREFERENCE TEST 150
GENERALLY RIGHT-HANDED AND RIGHT-FOOTED. BUT
NOT WELL ESTABLISHED. USED BOTH
[illegible] PRIMARY MENTAL ABILITIES TEST 151SCORE
[illegible] PMA VERBAL MEANING 152SCORE 7[illegible]
[illegible] PMA SPATIAL RELATIONS 153SCORE 129
[illegible] PMA PERCEPTUAL SPEED 154SCORE 103
[illegible] PMA NUMBER FACILITY 155SCORE 1[illegible]
[illegible] EARLY HISTORY REPORT 15[illegible]
[illegible] PRENATAL AND BIRTH HISTORY NOR[illegible] CONGENITAL
[illegible] (PULMONARY VALVULAR STENOSIS)
DISCOVERED AT [illegible] MO. UNDER OBSERVATION NO
APPARENT EFFECTS.
SAT ALONE--[illegible]
CRAWLED [illegible] 9 MO.
WALKED ALONE--17 MO.
TOILET TRAINING--3 YRS
NO SOCIAL AND BEHAVIOR PROBLEMS REPORTED BY
[illegible]
FIRST WORDS--3 YRS
FIRST SENTENCE --4 1/2 YRS
REPEATED KINDERGARTEN--COULD NOT FOLLOW DIREC-
TIONS OR EXPRESS IDEAS. THOUGHT TO BE IMMATURE
[illegible] AGE 12--NO LEARNING DIFFICULTIES

32 1[illegible] [illegible] RATING SCALE 1[illegible]
5 POINT SCALE
VERY POOR--1. AVERAGE--3. SUPERIOR--5.
AUDITORY COMPREHENSION
1. ABILITY TO FOLLOW ORAL INSTRUCTIONS--1
2. COMPREHENSION OF CLASS DISCUSSION--2
3. ABILITY TO RETAIN AUDITORY INFORMATION--1

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A56

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4. COMPREHENSION OF WORD MEANING--2
SPOKEN LANGUAGE
5. COMPLETE AND ACCURATE EXPRESSION--2
6. VOCABULARY ABILITY--1
7. ABILITY TO RECALL WORDS--2
8. ABILITY TO RELATE EXPERIENCE--2
9. ABILITY TO FORMULATE IDEAS--2
ORIENTATION
10. PROMPTNESS--3
11. SPATIAL ORIENTATION--4
12. JUDGEMENT OF RELATIONSHIPS--3
13. LEARNING DIRECTIONS--4
BEHAVIOR
14. COOPERATION--3
15. ATTENTION--2
16. ABILITY TO ORGANIZE--3
17. ABILITY TO COPE WITH NEW SITUATIONS--3
18. SOCIAL ACCEPTANCE--4
19. ACCEPTANCE OF RESPONSIBILITY--3
20. COMPLETION OF ASSIGNMENTS--2
21. TACTFULNESS--3
MOTOR
22. GENERAL COORDINATION--4
23. BALANCE--4
24. ABILITY TO MANIPULATE EQUIPMENT--4
05215 INFORMAL READING INVENTORY                          154
      INDEPENDENT LEVEL          PRE-PRIMER                  LEVEL
      INSTRUCTIONAL LEVEL        PRIMER                      LEVEL
      LISTENING LEVEL            FIRST READER                LEVEL
      FRUSTRATION LEVEL          FIRST READER                LEVEL
4021  ORAL MECHANISM EXAMINATION                           137
      NO ORAL MECHANISM ABNORMALITIES
      NOTICEABLE OVERBITE--ORTHODONTAL CORRECTION IN
      PROGRESS
END OF INFORMATION
```

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14060	WECHSLER INTELLIGENCE SCALE FOR CHILDREN	001FULL	114.0	
	WISC VERBAL 126 PERFORMANCE 97			
01006	WISC INFORMATION	002SS	14.0	
01006	WISC SIMILARITIES	003SS	12.0	
01006	WISC COMPREHENSION	004SS	16.0	
01006	WISC ARITHMETIC	005SS	10.0	
01006	WISC VOCABULARY	006SS	19.0	
01006	WISC DIGIT SPAN	007SS	14.0	
01006	WISC PICTURE COMPLETION	008SS	07.0	
01006	WISC PICTURE ARRANGEMENT	009SS	12.0	
01006	WISC BLOCK DESIGN	010SS	08.0	
01006	WISC OBJECT ASSEMBLY	011SS	11.0	
01006	WISC CODING	012SS	11.0	
01006	WISC MAZES	013SS	09.0	
01060	STANFORD BINET INTELLIGENCE SCALE	014IQ	124.0	
13191	ILLINOIS TEST OF PSYCHOLINGUISTIC ABILITIES	015PLA		
01110	ITPA AUDITORY RECEPTION	016AGE	09.6	
01110	ITPA VISUAL RECTPTION		017AGE	10
01110	ITPA VISUAL RECEPTION	017AGE	10.6	
01110	ITPA VISUAL ASSOCIATION	018AGE	08.0	
01110	ITPA VERBAL EXPRESSION	019AGE	06.1	
01110	ITPA MANUAL EXPRESSION	020AGE	09.6	
01110	ITPA GRAMMATIC CLOSURE	021AGE	05.6	
01110	ITPA VISUAL CLOSURE	022AGE	07.7	
01110	ITPA AUD. SEQUENTIAL MEMORY	023AGE	07.5	
01110	ITPA VISUAL SEQUENTIAL MEMORY	024AGE	03.0	
01110	ITPA AUDITORY CLOSURE	025AGE	06.0	
01110	ITPA SOUND BLENDING	026AGE	05.5	
01110	ITPA AUDITORY ASSOCIATION	027AGE	09.7	
13144	DETROIT TESTS OF LEARNING APTITUDE	028MA.		
01008	DETROIT PICTORIAL ABSURDITIES	029AGE	09.3	
01008	DETROIT VERBAL ABSURDITIES	030AGE	11.0	
01008	DETROIT PICTORIAL OPPOSITES	031AGE	07.2	
01008	DETROIT VERBAL OPPOSITIES	032AGE	11.5	
01008	DETROIT MOTOR SPEED	033AGE	07.0	
01008	DETROIT AUD. ATTENTION SPAN FOR UNRELATED WORDS	034AGE	09.0	
01008	DETROIT ORAL COMMISSIONS	035AGE	06.6	
01008	DETROIT VISUAL ATTENTION SPAN FOR OBJECTS	036AGE	10.0	
01008	DETROIT ORIENTATION	037AGE	11.0	
01008	DETROIT FREE ASSOCIATIONS	038AGE	11.1	
01008	DETROIT DESIGNS	039AGE	07.7	
01008	DETROIT AUD. ATTENTION SPAN FOR RELATED SYLLABLES	040AGE	09.0	
01008	DETROIT NUMBER ABILITY	041AGE	08.0	
01008	DETROIT SOCIAL ADJUSTMENT	042AGE	06.5	
01008	DETROIT VISUAL ATTENTION SPAN FOR LETTERS	043AGE	07.7	
01008	DETROIT DISARRANGED PICTURES	044AGE	08.8	
01008	DETROIT ORAL DIRECTIONS	045AGE	06.6	
01008	DETROIT LIKENESSES AND DIFFERENCES	046AGE	09.5	
16025	FROSTIG DEVELOPMENTAL TEST OF VISUAL PERCEPTION	047AGE	07.7	
01005	FROSTIG EYE MOTOR COORDINATION	048AGE	07.1	
01005	FROSTIG FIGURE GROUND PERCEPTION	049AGE	06.5	

01005	FROSTIG FORM CONSTANCY	050AGE	08.0
01004	FROSTIG POSITION IN SPACE	051AGE	08.0
01005	FROSTIG SPATIAL RELATIONSHIPS	052AGE	07.2
01020	LEERY-BUKTENICA DEV TEST VIS-MOTOR INTEGRATION	053AGE	07.6
02010	GOODENOUGH-HARRIS DRAW-A-MAN TEST	054	
	MAN SS 82 12TH %TILE WOMAN SS 76 5TH %TILE		
02015	HEATH RAILWALKING TEST	055	
	1 STD. DEV. BELOW MEAN FOR AGE		
18055	PURDUE PERCEPTUAL MOTOR SURVEY TEST	056	2.0
	AWKWARD		
	PURDUE WALKING BOARD		1.0
	PURDUE IDENTIFICATION OF BODY PARDS		2.0
	TASK RELATIVELY EASY FOR ARTHUR		
	PURDUE OBSTACLE COURSE		2.0
	PURDUE KRAUS-WEBER		2.0
	PURDUE ANGELS IN THE SNOW		2.0
	PURDUE CHALKBOARD		1.0
	PURDUE RHYTHMIC WRITING		2.0
	PURDUE OCULAR PURSUITS		1.0
	PURDUE VISUAL ACHIEVEMENT		2.0
	PURDUE IMITATION OF MOVEMENT		2.0
	BEHAVIOR ON THIS TEST WAS INCONSISTENT. ARTHUR WOULD		
	ARTHUR WOULD SUCCEED AT SOME AND FAIL AT SIMILAR ONES.		
02005	PURDUE WALKING BOARD	057	1.0
	MUCH EXCESS MOVEMENT		
02005	PURDUE JUMPING	058	2.0
	NORMAL		
02005	PURDUE IDENTIFICATION OF BODY PARTS	059	2.0
	ALL CORRECT		
01005	PURDUE OBSTACLE COURSE	060	2.0
01005	PURDUE KRAUS-WEBER	061	2.0
02005	PURDUE ANGELS-IN-THE-SNOW	062	2.0
	SHADOW MOVEMENTS		
01005	PURDUE CHALKBOARD	063	1.0
01005	PURDUE RHYTHMIC WRITING	064	1.0
01005	PURDUE OCULAR PURSUITS	065	2.0
01005	PURDUE VISUAL ACHIEVEMENT	066	1.0
02005	PURDUE IMITATION OF MOVEMENT	067	2.0
	INCONSISTENT		
06020	PICTURE STORY LANGUAGE TEST	068	
01004	PSLT PRODUCTIVITY-TOTAL WORDS	069AGE	7.0
01004	PSLT PRODUCTIVITY-WORDS PER SENTENCE	070AGE	7.2
01004	PSLT PRODUCTIVITY-TOTAL SENTENCES	071AGE	6.2
01004	PSLT SYNTAX QUOTIENT	072AGE	6.3
01004	PSLT ABSTRACT-CONCRETE	073AGE	10.7
01015	PEABODY PICTURE VOCABULARY TEST	074IQ	153.0
05015	TEMPLIN-DARLEY TEST OF ARTICULARTION	075	
	ARTICULATION NORMAL		
04030	WIDE-RANGE ACHIEVEMENT TESTS	076	
01010	WIDE-RANGE SPELLING	077AGE	6.9
01010	WIDE-RANGE ARITHMETIC	078AGE	9.0

01010	WIDE-RANGE READING	079AGE	8.3
01005	VINELAND SOCIAL MATURITY SCALE	08X.Y	
11060	GATES-RUSSELL SPELLING DIAGNOSTIC TESTS	081	
01005	GATES-RUSSELL SPELLING WORDS ORALLY	082GRADE	5.0
01005	GATES-RUSSELL WORD PRONUNCIATION	083GRADE	4.5
01005	GATES-RUSSELL GIVING LETTER FOR LETTER SOUND	084GRADE	3.1
01005	GATES-RUSSELL SPELLING ONE-SYLLABLE	085GRADE	4.5
01005	GATES-RUSSELL SPELLING TWO-SYLLABLES	086GRADE	4.5
01005	GATES-RUSSELL WORD REVERSALS	087GRADE	4.5
01000	GATES-RUSSELL SPELLING ATTACK	088GRADE	4.0
01000	GATES-RUSSELL AUDITORY DISCRIMINATION	089GRADE	5.0
01000	GATES-RUSSELL VISUAL-AUDITORY-KINESTHETIC	090GRADE	5.0
01000	GATES-RUSSELL COMBINED STUDY METHODS	091GRADE	4.5
24.55	GATES-MCKILLOP READING DIAGNOSTIC TESTS	092	
14010	GATES-MCKILLOP ORAL READING	093GRADE	3.2
	ANALYSIS OF TOTAL ERRORS		
	OMISSIONS, WORDS	MEDIUM	
	ADDITIONS, WORDS	MEDIUM	
	REPETITIONS	HIGH	
	MISPRONUNCIATIONS	HIGH	
	ANALYSIS OF MISPRONUNCIATIONS		
	FULL REVERSALS		
	REVERSAL OF PARTS		
	TOTAL WRONG ORDER		
	WRONG BEGINNINGS		
	WRONG MIDDLES		
	WRONG ENDINGS		
	WRONG SEVERAL PARTS		
01005	GATES-MCKILLOP WORDS-FLASHED PRESENTATION	094GRADE	3.5
01005	GATES-MCKILLOP WORDS-UNTIMED PRESENTATION	095GRADE	4.5
01005	GATES-MCKILLOP PHRASES-FLASH PRESENTATION	096GRADE	3.2
01005	GATES-MCKILLOP KNOWLEDGE OF WORD PARTS	097LOW	
01005	GATES-MCKILLOP LETTER SOUNDS	098NORMAL	
01005	GATES-MCKILLOP LETTER NAMES	099NORMAL	
01000	GATES-MCKILLOP RECOGNIZING VISUAL FORM OF SOUNDS	100LOW	
01000	GATES-MCKILLOP AUDITORY BLENDING	01HIGH	
01000	GATES-MCKILLOP SUPPLEMENTARY TESTS	102	
01015	LINCOLN-OSERETSKY TESTS	103070 ILE	55.0
03040	GATES-MACGINITIES READING TESTS	104GRADE	3.2
01020	GATES-MACGINITIES VOCABULARY	105GRADE	3.1
01020	GATES-MACGINITIE COMPREHENSION	106GRADE	3.4
05015	METROPOLITAN ACHIEVEMENT TESTS	107GRADE	
01015	MAT WORD KNOWLEDGE	108GRADE	4.5
01015	MAT WORD DISCRIMINATION	109GRADE	4.0
01015	MAT READING	110GRADE	3.9
01015	MAT ARITHMETIC CONCEPTS AND SKILLS	111GRADE	3.5
03030	METROPOLITAN ELEMENTARY ARITHMETIC TEST	112GRADE	3.7
01015	MAT ARITHMETIC COMPUTATION	113GRADE	4.1
04015	MEAT PROBLEM SOLVING AND ARITH. CONCEPTS	114GRADE	3.9
01010	GILMORE ORAL READING TEST	115GRADE	3.3
15065	DURRELL ANALYSIS OF READING DIFFICULTY	116	
01005	DURRELL ORAL READING	117GRADE	3.5
01005	DURRELL SILENT READING	118GRADE	3.6
01005	DURRELL LISTENING	119GRADE	5.1
01005	DURRELL FLASH	120GRADE	3.N

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01005 DURRELL WORD ANALYSIS                                  121GRADE    4.0
01005 DURRELL SPELLING                                       122GRADE    3.5
01005 DURRELL HANDWRITING                                    123POOR
01005 DURRELL NAMING LETTERS                                 124NORMAL
01005 DURRELL VISUAL MEMORY OF WORDS                         125GRADE    2.9
01005 DURRELL HEARING SOUNDS IN WORDS                        126GRADE    4.0
01005 DURRELL SPELLING-VISUAL MEMORY                         127GRADE    3.0
01005 DURRELL SPELLING-PHONICS                               128GRADE    3.7
02005 DURRELL SPELLING TEST                                  129GRADE    3.5

01015 GRAY ORAL READING                                      130GRADE    3.6
06025 MONROE READING APTITUDE                                1310/0 ILE 50.0
01005 MONROE VISUAL                                          1320/0 ILE 30.0
01005 MONROE AUDITORY                                        1330/0 ILE 72.0
01005 MONROE MOTOR                                           1340/0 ILE 45.0
01005 MONROE ARTICULATION                                    1350/0 ILE 76.0
01005 MONROE LANGUAGE                                        1360/0 ILE 91.0
09040 MEDICAL REPORTS                                        137
      PSYCHIATRIC REPORT
           IMMATURE DUE TO DEPENDENCE ON MAID WHO HAS BEEN
           WITH FAMILY FOR FIFTEEN YEARS
      NEUROLOGICAL REPORT
           NORMAL
           OPHTHALMOLOGICAL REPORT     NORMAL
      EEG REPORT                                                NORMAL

03010 PSYCHIATRIC REPORT                                     138
           IMMATURE DUE TO DEPENDENCE ON MAID WHO HAS BEEN WITH
            THE FAMILY FOR FIFTEEN YEARS
03010 NEUROLOGICAL REPORT                                    139
            NORMAL

01010 OPHTHALOGICAL REPORT                                   140NORMAL
01010 EEG REPORT                                             141NORMAL
01010 KEYSTONE VISUAL SCREENING                              142NORMAL
01010 AUDIOMETRIC SCREENING                                  143NORMAL
01005 SEGUIN FORM BOARD                                      144AGE      7.5
01005 KNOX CUBE TEST                                         145AGE      9.0
01005 WEPMAN AUDITORY DISCRIMINATION TEST                    146ALL OK
01002 DYNOMOMETER            NO HAND PREFERENCE              147
03015 LANGUAGE AND SPEECH REPORT                             148
           LANGUAGE IS HIGH FOR HIS AGE. SPEECH IS
           CLEAR AND PRECISE
01007 BENDER-GESTALT TEST                                    149DA       3.2
02007 LATERALITY PREFERENCE TEST                             150
           CONSTANTLY CHANGES PENCIL FROM HAND TO HAND
05028 PRIMARY MENTAL ABILITIES TEST                          151SCORE   112
01007 PMA VERBAL MEANINGS                                    152SCORE   124
01007 PMA SPATIAL RELATIONS                                  153SCORE    91
01007 PMA PERCEPTUAL SPEED                                   154SCORE    90
01007 PMA NUMBER FACILITY                                    155SCORE    95
13005 CASE HISTORY REPORT                                    156
           ARTHUR HAS DIFFICULTY CONCENTRATING ON SCHOOL SUBJECTS. HIS
           ORAL LANGUAGE IS EXCELLENT, AND HE HAS LITTLE TROUBLE COMM
           UNICATING.  HE IS VERY DEPENDENT UPON THE MAID WHO HAS BEEN
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WITH FAMILY FOR FIFTEEN YEARS9 UNTIL LAST YEAR SHE DRESSED HIM, PICKED UP HIS CLOTHES, ETC. ARTHUR WAS SIX WEEKS PREMATURE AND SPENT THREE WEEKS IN AN ISOLETTE9 HE HAS HAD EAR INFECTIONS, T AND A AT AGE 6. HE HAS HAD PNEUMONIA FOUR TIMES, RECEIVED SURGERY FOR A HERNIA, AND HAD STOMACH PUMPED AT AGE THREE BECAUSE HE SWALLOWED FORMALDEHYDE.

15010 BEHAVIOR RATING SCALE	157		

DEMANDS ATTENTION FOR ANY SMALL PROBLEM. OFTEN THROWS TANTRUMS IF HE DOESN T GET HIS WAY. USUALLY OBEYS IN SCHOOL, ALTHOUGH RECENTLY HE HAS BEEN ACTING UP AND OUT IN SCHOOL TO WIN APPROVAL FROM HIS PEERS.

04015 INFORMAL READING INVENTORY	158		2.5
INDEPENDENT LEVEL		GRADE	3.5
INSTRUCTIONAL LEVEL		GRADE	4.0
FRUSTRATION LEVEL		GRADE	

Shared-time Interactive Diagnosis (ON-LINE)

The following printouts were taken from the permanent records which is made of each student or group by the LINGO system. These records may be scanned by the teacher, or by a program, to produce statistics showing which tests are used by which students during the diagnostic procedure.

```
*** RESPONSES ARE BEING RECORDED ***

IF AT ANY TIME YOU ARE CONFUSED AND CANNOT CONTINUE,
TYPE THE WORD *HELP*.

WHAT IS YOUR NAME, PLEASE.
KCMBACCT
HELLO, KCMBACCT
********* INTRO
WHICH GROUP MEMBERS ARE PRESENT
MERLE KATHY ANNE CAROL, PAM
DO YOU ALREADY KNOW HOW TO USE THE SIMULATOR
+
YES
*********
********* NEW
WHICH CASE DO YOU WISH TO USE
TYPE *DONE* TO QUIT
+
HARVEY
*********
********* SEARCH
CASE... HARVEY SIMCASE   AGE...9.8   GRADE...4.9
REASON FOR REFERRAL ...HARVEY READS POORLY IN SCHOOL
TYPE *DONE* WHEN FINISHED.
TIME NOW IS 9.  A.M.
WHICH TEST DO YOU SELECT NEXT.
WISC
********* NAMES
********* SEARCH
TEST NUMBER 1
WECHSLER INTELLIGENCE SCALE FOR CHILDREN  FULL 120.0
WISC VERBAL 125, WISC PERFORMANCE 110
WISC INFORMATION        SS 14.0
WISC SIMILARITIES       SS 15.0
WISC COMPREHENSION      SS 14.0
WISC ARITHMETIC         SS 15.0
WISC VOCABULARY         SS 15.0
WISC DIGIT SPAN         SS 10.0
WISC PICTURE COMPLETION SS 11.0
WISC PICTURE ARRANGEMENTSS 12.0
WISC BLOCK DESIGN       SS  9.0
WISC OBJECT ASSEMBLY    SS 12.0
WISC CODING             SS 13.0
WISC MAZES              SS 11.0
120 MINUTES LEFT IN THE TESTING SESSION.
TIME NOW IS 1. 0 A.M.
WHICH TEST DO YOU SELECT NEXT.
79
WIDERANGE READING    AGE 6.1
110 MINUTES LEFT IN THE TESTING SESSION.
TIME NOW IS 1010 A.M.
WHICH TEST DO YOU SELECT NEXT.
154
.....CASE HISTORY REPORT.....
PRE- AND POST-NATAL HISTORY NORMAL. NO PREGNANCY COMPLICA-
TIONS.LOW WRITTEN LANG SKILLS. EXTREME HOSTILITY TO YOUNGER
SISTER. PED NOTED UNUSUAL TOE POSITION. REF TO PED NEUROLO-
GIST. CHILD TOO YOUNG FOR DIAGNOS. DOESNT CHEW FOOD PROPERLY.
JUMBLED SPEECH. BECOMES FURIOUS WHEN ASKED TO REPEAT HIMSELF.
NURSERY TEACH SAYS CANNOT USE SCISSORS. RDG WORD POOR. 4 GRADE
WAS UNMOTIVATED,RESTLESS,DISINTERESTED IN READING. CANT TELL
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Sh... 1 F...
Diagnosis

```
TIME. POSSIBILITY A SIBLING RIVALRY REPORTED. POOR IN SPORTS.
105 MINUTES LEFT IN THE TESTING SESSION.
TIME NOW IS 1015 A.M.
WHICH TEST DO YOU SELECT NEXT.
156
PMA PERCEPTUAL SPEED   SCORE  96.0
98 MINUTES LEFT IN THE TESTING SESSION.
TIME NOW IS 1022 A.M.
WHICH TEST DO YOU SELECT NEXT.
149
BENDER-GESTALT TEST        DA 7.9
91 MINUTES LEFT IN THE TESTING SESSION.
TIME NOW IS 1029 A.M.
WHICH TEST DO YOU SELECT NEXT.
114
DURRELL SILENT READING         GRADE 3.2
86 MINUTES LEFT IN THE TESTING SESSION.
TIME NOW IS 1034 A.M.
WHICH TEST DO YOU SELECT NEXT.
117
DURRELL ORAL READING           GRADE 3.5
81 MINUTES LEFT IN THE TESTING SESSION.
TIME NOW IS 1039 A.M.
WHICH TEST DO YOU SELECT NEXT.
148
LANGUAGE AND SPEECH REPORT
   ORAL MECH. SLOW. SPEECH FAST AND IMPRECISE, AND
   DIADOCHOKINETIC RATE IS SLOW.
46 MINUTES LEFT IN THE TESTING SESSION.
TIME NOW IS 1054 A.M.
WHICH TEST DO YOU SELECT NEXT.
65
PURDUE OCULAR PURSUITS       3.0
61 MINUTES LEFT IN THE TESTING SESSION.
TIME NOW IS 1059 A.M.
WHICH TEST DO YOU SELECT NEXT.
138
 PSYCHIATRIC REPORT
   POOR EGO CONTROL, LOW SELF-IMAGE. TEMPER TANTRUMS
51 MINUTES LEFT IN THE TESTING SESSION.
TIME NOW IS 1109 A.M.
WHICH TEST DO YOU SELECT NEXT.
101
GATES-MCKILLOP AUDITORY BLENDING      NORMAL
46 MINUTES LEFT IN THE TESTING SESSION.
TIME NOW IS 1114 A.M.
WHICH TEST DO YOU SELECT NEXT.
43
DETROIT AUD. ATTEN. SPAN. RELATED SYLLABLES  AGE 13.6
38 MINUTES LEFT IN THE TESTING SESSION.
TIME NOW IS 1122 A.M.
WHICH TEST DO YOU SELECT NEXT.
125
DURRELL VISUAL MEMORY OF WORDS      GRADE 2.0
33 MINUTES LEFT IN THE TESTING SESSION.
TIME NOW IS 1127 A.M.
WHICH TEST DO YOU SELECT NEXT.
17
ITPA VISUAL RECEPTION      SS 34  AGE 8.8
23 MINUTES LEFT IN THE TESTING SESSION.
TIME NOW IS 1137 A.M.
WHICH TEST DO YOU SELECT NEXT.
140
OPHTHALOLOGICAL REPORT    NORMAL
13 MINUTES LEFT IN THE TESTING SESSION.
TIME NOW IS 1147 A.M.
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2

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WHICH TEST DO YOU SELECT NEXT.
114
ONLY 13 MINUTES REMAIN. TEST 114 REQUIRES 15.
TIME NOW IS 1147 A.M.
WHICH TEST DO YOU SELECT NEXT.
100
GATES-MCKILLOP RECOGNIZING VISUAL FORM OF SOUNDS   NORMAL
8 MINUTES LEFT IN THE TESTING SESSION.
TIME NOW IS 1152 A.M.
WHICH TEST DO YOU SELECT NEXT.
80
VINELAND SOCIAL MATURITY SCALE    SQ 95.0
3 MINUTES LEFT IN THE TESTING SESSION.
TIME NOW IS 1157 A.M.
WHICH TEST DO YOU SELECT NEXT.
DONE
THATS THE END OF THE MORNING SESSION.
HARVEY SIMCASE HAS GONE TO LUNCH NOW.

NOW YOU HAVE A 2-HOUR AFTERNOON SESSION.

TYPE GO WHEN FINISHED.
TIME NOW IS 1[illegible] P.M.
WHICH TEST DO YOU SELECT NEXT.
77
WIDE-RANGE SPELLING   AGE 7.8
110 MINUTES LEFT IN THE TESTING SESSION.
TIME NOW IS 11[illegible] P.M.
WHICH TEST DO YOU SELECT NEXT.
82
GATES-RUSSELL SPELLING WORDS ORALLY   GRADE 2.8
105 MINUTES LEFT IN THE TESTING SESSION.
TIME NOW IS 115 P.M.
WHICH TEST DO YOU SELECT NEXT.
111
MAT ARITHMETIC CONCEPTS AND SKILLS   GRADE 5.0
90 MINUTES LEFT IN THE TESTING SESSION.
TIME NOW IS 1[illegible] P.M.
WHICH TEST DO YOU SELECT NEXT.
46
PICTURE STORY LANGUAGE TEST  E
PSLT PRODUCTIVITY- TOTAL WORDS              AGE 11.9
PSLT PRODUCTIVITY- WORDS PER SENTENCE AGE  9.9
PSLT PRODUCTIVITY- TOTAL SENTENCES         AGE 17.5
PSLT SYNTAX QUOTIENT                        AGE  9.3
PSLT ABSTRACT- CONCRETE              ABOVE AGE 17.5
7[illegible] MINUTES LEFT IN THE TESTING SESSION.
TIME NOW IS 1[illegible] P.M.
WHICH TEST DO YOU SELECT NEXT.
22
ITPA VISUAL CLOSURE    SS 30   AGE 6.8
6[illegible] MINUTES LEFT IN THE TESTING SESSION.
TIME NOW IS 20[illegible] P.M.
WHICH TEST DO YOU SELECT NEXT.
23
ITPA AUD. SEQUENTIAL MEMORY   SS 40   ABOVE AGE 10.3
50 MINUTES LEFT IN THE TESTING SESSION.
TIME NOW IS 21[illegible] P.M.
WHICH TEST DO YOU SELECT NEXT.
DONE
THATS ALL THEN. NOW MAKE A DIAGNOSIS.
********* FINAL
****
DIAGNOSIS...
YOU WILL PLEASE GIVE YOUR OWN OPINIONS ON
```

```
THE FOLLOWING OPINIONS, THEN YOU WILL SEE THE
OPINIONS OF THE OTHER STUDENTS IN YOUR GROUP
AND FINALLY THE OPINIONS OF THE EXPERTS.

********* GETDATA
***4
IN YOU PROFESSIONAL OPINION,
DOES THE CHILD HAVE A LEARNING DISABILITY.
YES
***C
WHAT I  THE BASIS FOR YOUR DECISION TO SAY = YES =+
I.E. FORMULA, DEVELOPMENTAL IMBALANCES, INTUITION, ETC.+
(TYPE UP TO 5 LINES BELOW. TYPE =///= WHEN DONE.
LERNING QUOTIENT FOR READING .80, SIGNIFICANT DISCREPANCY
BETWEEN ABILITY AND ACHIEVEMENT IN READING AND SPELLING.
MOTOR PROBLEMS AFFECTING SPEECH , VISUAL MOTTOR PROBLEMS.
///
***D
WHAT AREAS OF INTEGRITIES DOES THE CHILD SEEM TO HAVE+
(AGAIN, UP TO 5 LINES. TYPE =///= WHEN DONE.)
AUDITORY
///
***E
WHAT AREAS OF DEFICITS DOES THE CHILD SEEM TO HAVE+
(5 LINES AGAIN.)
VISUAL ,  VISUAL PROCESSING, VISUAL MOTOR, MOTOR///
***F
WHAT ARE THE PRESENT DEVELOPMENTAL LEVELS FOR THE CHILD
(BY AGE, GRADE, OR ANY OTHER FASHION) CONCERNING ANY AREA YOU
FEEL IS PERTINENT (E.G. INTELLIGENCE, MOTOR, SOCIAL,
LANGUAGE, ACADEMIC, ETC)+
SEE THE ABOVE///
***G
DEGREE OF EMOTIONAL OVERLAY (NONE, SOME, MODERATE,
SEVERE, PRIMARY, SECONDARY, ETC)+
YES, SECONDARY///
***H
ETIOLOGY OF THE CASE (CAUSAL FACTORS)
UNKNOWN///
***I
WHAT IS YOUR OVERALL DIAGNOSIS OF THIS CASE
SEVERE VISUAL PROBLEMS, SOME MOTOR PROBLEMS///
***J
WHAT KIND OF EDUCATIONAL PLACEMENT WOULD YOU RECOMMEND
RESOURCE ROOM, DAILY///
***K
WHAT APPROACH DO YOU SUGGEST FOR CLINICAL TEACHING
(METHODOLOGY, TECHNIQUES, MATERIALS, LEARNING PROCESSES, ETC)
///
***L
WHAT FURTHER REFERRALS OR RECOMMENDATIONS WOULD YOU MAKE.
NO TIME///
***M
DOES YOUR TEAM HAVE ANY FURTHER COMMENTS, OR IF YOUR TEAM
IS NOT PRESENT, WHAT COMMENTS HAVE YOU ABOUT YOUR
DIAGNOSIS WHICH MAY BE RELEVANT TO OTHER TEAM MEMBERS.
WE WISH THERE WERE MORE TIME///
********* PUTDATA
********* SEARCH
********* RECORDS
```

WORKBOOK

for BASIC Programming

for

620-C07

INTRODUCTION TO COMPUTER APPLICATIONS IN COMMUNICATIVE DISORDERS

Northwestern University

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INTRODUCTION

The purpose of this workbook is to present to the student the fundamental grammar and vocabulary of the BASIC computer programming language. It is geared to the student who has not had extensive computer experience and has drawn its illustrations from the fields of communicative disorders, learning disabilities, speech pathology, hearing impaired, audiology and education.

Within the last decade the electronic digital computer has been transformed from a machine used primarily by business and science to a device which is considered a necessary tool in almost every field of endeavor. Some knowledge and familiarity with its technology is considered part of a broad education of any sort today. Universities are now taking account of the importance of the computer by offering more courses on programming, systems analysis, simulation, and have even instituted departments of computer science. A great many students, however, for instance those in the fields of learning disabilities and related areas, need not gain an in-depth understanding of the computer, but need only a general understanding so that they might use it in their work and more importantly, learn enough to effectively communicate with computer people. It is for this reason that we feel each student should learn the BASIC computer programming language, for it is a simple language which can be learned in a minimum amount of time, and by learning to use it the student can get a far better understanding of the capabilities and limitations of the computer.

BASIC was developed at Dartmouth College under the direction of Professor J.G. Kemeny and was implemented on a G.E. system. BASIC is a language which can be used and is most commonly used in a time-sharing environment where the student sits at a computer terminal (a type-writer like unit) and a number of students gain access to the computer simultaneously, or it can be used in a batch processing environment where the user places his instructions and data on punched cards which are submitted to the computer for processing.

CONTENTS

TECHNIQUES USED IN DEVELOPING A PROGRAM

To make a computer do your work, you must provide it with control information (certain information which is used to identify you, the account which is to be charged for the computer time used, the programming language you plan to use), the program (this tells the computer what work it is to do), and data (information the computer needs to do its work).

To enter a program into the CDC 6400 at Northwestern University for on-line processing, for instance, one would code:

Control Information

```
VJOB, ------------.   Student's Name
EDITOR.
%E
MODE=BASIC
```

Program

```
10 REMARK--CONVERT IQ AND CHRONOLOGICAL AGE INFO INTO MA INFO
20  C1=0
30  IF C1=3000 THEN 90
40  INPUT A,I
50  C1=C1+1
60  M=(A*I)/100
70  PRINT M
80  GO TO 30
90  STOP
100 END
```

Control Information

```
GO
```

Data

```
148
110
108
 .
 .
 .
```

When developing a computer program it is important that the student:

1) Completely understand the requirements of the problem being studied and the procedure needed to obtain the desired results.

2) Be familiar with the capabilities of the programming language he has chosen. This is necessary so that the student can readily determine whether the procedure developed for solving the problem can be translated easily into a computer program. It might be determined that the procedure developed needs to be altered or a new programming language chosen to most efficiently achieve the desired results.

3) It is convenient, especially for a beginning programmer, to next translate his procedure for problem solution into a conceptual diagram (flow chart).

4) It is then a relatively simple matter to convert this diagram in an orderly fashion into a grammatically correct computer program.

5) Next the student should execute his program to verify that the final results calculated by it actually meet the problem requirements. This step might require that the student use dummy data (data for which he knows what results to expect) to check out his procedure and program before using his real data (data for which he is interested in finding an answer).

EXAMPLE

The Ann Arbor Psychological Evaluation Center wished to use some of the data gathered by an outside research firm for one of their studies. Their study required mental age information but unfortunately the research team only recorded the chronological ages and Intelligent Quotients of the 3,000 children they tested. The Center decided that by writing a BASIC computer program they could easily use the punched cards prepared by the research team to obtain the information they needed.

Using the above model one can see how such a program would be developed.

1) Completely the understand the problem and procedure needed--

a) Mental age can be computed with chronological age and IQ information using the formula $MA = \frac{CA \times IQ}{100}$

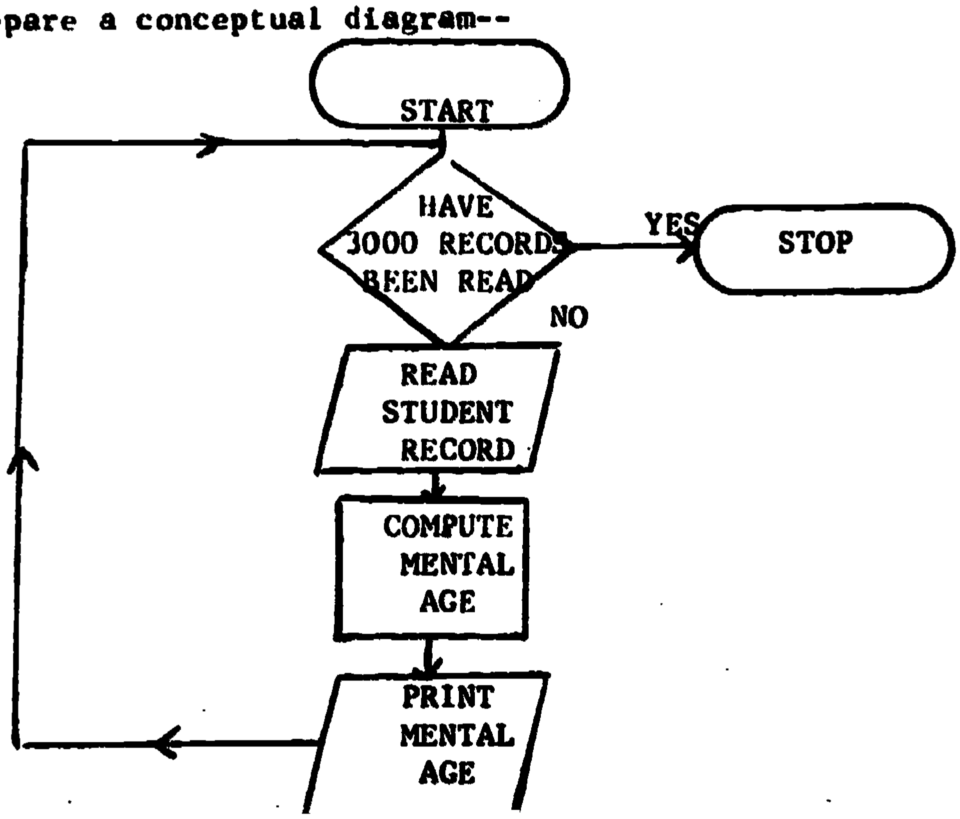
b) There are 3,000 children so the procedure will have to be repeated more than once.

2) Be familiar with the capabilities of the programming language chosen--

a) Multiplication and division can be easily performed in BASIC by using the * and / operation.

b) Repetitive operations can be easily performed in BASIC by using the GO TO or FOR NEXT instructions.

3) Prepare a conceptual diagram--



4) Convert the diagram into a computer program--

```
10 REMARK--CONVERT IQ AND CHRONOLOGICAL AGE INFO INTO MA INFO
20  C1=0
30  IF C1=3000 THEN 90
40  INPUT A,I
50  C1=C1+1
60  M=(A*I)/100
70  PRINT M
80  GO TO 30
90  STOP
100 END
```

5) Verify final results--

This step might require a hand calculation to insure that the procedure is correct and that the program is working as expected.

EXERCISE - Techniques used in developing a program.

The Saginaw Public School System was interested in preparing a list of what they termed "gifted children", using as their criterion those children with IQ scores above 148.

Prepare a flow chart which would depict the procedure you would use to get the necessary information. (Assume that the school system has IQ scores available and that it has an enrollment of 5000 students).

List the programming language capabilities needed to solve this problem.

BASIC VOCABULARY AND GRAMMAR

A programming language must have facilities which will allow information to be entered into the computer (INPUT CAPABILITIES), must have the the ability to instruct the computer to manipulate data once it has been entered (PROCESSING CAPABILITY), and must finally be able to inform the student of the answer to his problem (OUTPUT CAPABILITY). In the above program, line 40 is a BASIC input instruction; lines 20, 30, 50, 60, 80, 90, 100 are processing instructions, while line 70 is a BASIC output instruction. It is with these capabilities in mind that we plan to discuss the vocabulary and grammar of BASIC.

Fundamental Elements of the BASIC Language

INSTRUCTION SEQUENCE. The computer will process each instruction in the order written in a user's program unless one of the instructions in the sequence directs non-sequential execution.

GENERAL INSTRUCTION FORMAT. Each BASIC instsruction must be numbered and the numbers must be unique and in ascending order. Note in the program discussed above, the instructions were numbered 10, 2C, 30...100. They could have just as easily been numbered 1, 2, ...10, or 2, 4, ...20. It is generally a good idea to leave gaps when assigning numbers so that additional instructions can be inserted easily without the need to renumber all of the existing instructions. The line numbers can contain from 1 to 5 digits, i.e., from 1 to 99,999. Blanks have no significance except within string constants and string variables. A BASIC statement may contain up to 72 characters.

CONSTANTS. A constant is a quantity that has a fixed value throughout a program. BASIC recognizes two types of constants, the NUMERIC constant and the STRING constant,

NUMERIC CONSTANT - is a signed or unsigned number with or without a decimal point.

Examples: 1, -1, 105.2, .3, -.016

STRING CONSTANT - is a collection of numeric, alphabetic or special characters enclosed in quotation marks. They often serve as messages.

Examples: "THIS IS A BASIC STRING CONSTANT"
"201"

VARIABLES. A variable is a quantity referred to by a name because it may change in value during the processing of a program. A simple way of viewing computer memory is to think of it as a collection of containers. Each container can hold a number or alphabetic information. However, new data can be placed in the container at any time, so for convenience a name is assigned to the container and this name is used to refer to the number which is currently in it. For instance, the variable A refers to a container with the name A. This container may have the value 3 at one point during the program execution and 8 at still another time. It is for this reason that A is termed a variable.

BASIC VARIABLES. There are certain conventions for naming variables which represent numeric information in BASIC. They are named with a one or two character identifier. The first character must be alphabetic, while the second must be numeric. There are 286 acceptable variable names. Can you name them?

Examples: A; Z, A0, B3

STRING VARIABLES. There are certain conventions for naming variables which represent alphanumeric or string information in BASIC. They are named with a two character identifier. The first character must be alphabetic and the second must be a dollar sign. The alphanumeric information may not contain a quote and can only have a maximum length of 72 characters.

Examples: A$, Z$

EXERCISES - Fundamental Elements of the BASIC Language

1) Check whether the following items are considered constants or variables by the BASIC programming language:

	Check one	
	CONSTANT	VARIABLE
a) 123.1	______	______
b) "123.1"	______	______
c) A0	______	______
d) G	______	______
e) -3	______	______
f) "variable"	______	______
g) X9	______	______
h) 0.079	______	______
i) M	______	______
j) M$	______	______

2) Identify the correctly coded variables and constants. For those which are unacceptable to the BASIC programming language, specify the rule which makes them unacceptable.

	ACCEPTABLE	UNACCEPTABLE	WHY UNACCEPTABLE
a) 0.34	______	______	______
b) "-7.31"	______	______	______
c) A32	______	______	______
d) -A	______	______	______
e) MA	______	______	______
f) "-A"	______	______	______
g) 754	______	______	______
h) $N	______	______	______
i) "FULL SCALE IQ=100	______	______	______
j) 3G	______	______	______
k) P$	______	______	______
l) 0	______	______	______

3) Number the statements in the following program so that additional instructions can be added if need be.

```
_______ INPUT  A,C
_______ C=A+C
_______ PRINT C
_______ STOP
_______ END
```

4) Has the following program been numbered correctly? _____ Why?_____

```
11  INPUT A,C
    C=A+C
21  PRINT C
31  STOP
37  END
```

5) True or False:

a) Statement numbers must be consecutive

b) Statement numbers may consist of one to five digits

c) It is valid to assign the same statement number to several statements in a program

d) Every BASIC statement need not be assigned a number

e) Statement numbers must be assigned in increasing order of magnitude.

Basic Instructions

1) INPUT.

FORMAT: line number INPUT V_1, V_2 where V_i are variables.

EXAMPLE: 10 INPUT A, G2, $B

The INPUT statement allows the programmer to inform the computer of the data which is to be used during program execution. Signed or unsigned numeric constants as well as string information can be entered by means of the INPUT instruction. String information entered in response to an input request should be enclosed in quotes.

2) PRINT

FORMAT: line number PRINT VC1, VC2... where VCi are variables or constants (numeric or string).

EXAMPLE:

```
20 PRINT "The value of the variable A=", A
30 PRINT 200, G2
```

The PRINT statement allows the user to see the current value of a variable or to output messages at the computer terminal.

FORMAT OF PRINTED OUTPUT

The print line of a BASIC program is divided into five zones. Each zone has fifteen positions. The comma in the PRINT statement indicates to the computer that the printer is to move to the next print zone.. If the fifth print zone has been filled before the comma is encountered, the information will be printed in the first position of the following print line.

For instance, PRINT 10,20,30,40,50 causes the following to print.

```
o 10-------------|20-------------|30-------------|40-------------|50
o                |               |               |               |
o                |               |               |               |
o                |               |               |               |
```

and PRINT 10,20,30,40,50,60 causes the following to print.

```
o 10-------------|20-------------|30-------------|40-------------|50
o 60             |               |               |               |
o                |               |               |               |
o                |               |               |               |
```

Ncte that each time a PRINT instruction is encountered, printing will begin in the first zone of a print line.

For eaxmple: PRINT 10,20
PRINT 30,40 causes the following to print

```
o 10--------|20
o 30--------|40
```

TERMINATING PRINT STATEMENT WITH A COMMA

A comma placed at the end of the PRINT statement causes the printer to continue printing in the next print position of the line previously written.

For example: PRINT 10,20,
PRINT 30,40 causes the following to print.

```
o 10-------------|20-------------|30-------------|40
o                |               |               |
o                |               |               |
```

Titles which contain more than 15 characters will occupy more than one print zone.

For example, PRINT "SCALED SCORE INFORMATION"

```
o SCALED SCORE IN|FORMATION
o                |
```

SHORTENING SIZES OF A PRINT ZONE

A semicolon can be used in a PRINT statement in place of a comma to shorten the size of a print zone (remember each print zone contains fifteen positions). The following will result when a semi-colon is included.

If the number printed contains 1-3 characters, the zone is shortened to 6 spaces; if the number contains 4-6 characters, the zone is shortened to 9 spaces; if it contains 7-9 characters, the zone is shortened to 12 spaces; for numbers of 10 or more characters, the zone is not shortened and contains 15 spaces.

Number Size	Zone Size
1-3	6
4-6	9
7-9	12
>10	15

For example: PRINT 20; 3578; 30 would cause the following to print.

```
o  20----|3578-----|30----
o        |         |
```

Semicolons and commas may be intermixed in a PRINT statement.

TABULATION

A TAB command used in a PRINT statement causes the computer to print information beginning in the position specified. This somewhat resembles a tab stop on a typewriter. Tab arguments from 1 to 72 may be used. If the argument is less than the current print position TAB has no effect. The semicolon has to be used as a separator.

EXAMPLE: 20 PRINT TAB (10);2;TAB(20): "IS THE ANSWER"

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
o                 2                                IS THE ANSWER
o
```

3) STOP

FORMAT: line number STOP

This instruction is used to stop program execution and may appear at any point in the program.

EXAMPLE: 325 STOP

4) END

FORMAT: line number END

The END statement indicates the termination of a program. Every program must have the END statement as the last and highest line number.

EXAMPLE: 25 END

You are now ready to write a BASIC program which will enter chronological age and IQ information into the computer and then print it so that it may be retained as a permanent record. This, of course, is a trivial program and not one that would ordinarily be coded. However, we only have a limited number of instructions at our disposal at this time and thus this is all we are capable of doing so far.

```
10 INPUT C,I
20 PRINT "Chronological age =", C, "IQ=", I
30 END
```

When this program is executed, a question mark will be printed on the terminal when the INPUT instruction is encountered. The question mark is requesting the user to enter the value of the chronologcial age and the IQ. Assuming the child is 109 months and has an IQ of 118, the user would type 109,118 after the question mark. (Note that the user must enter chronological age before IQ to ensure correct processing; Why?) The computer would then print on the terminal:

Chronological age = 109 IQ = 118

as a permanent record for the user.

At this point we are now ready to learn the processing instructions provided the user by the BASIC programming language.

5) BASIC EXPRESSIONS AND REPLACEMENT STATEMENTS.

There are five basic arithmetic operations which can be performed by the BASIC programming language: addition, subtraction, multiplication, division and exponentiation. The symbols used are:

addition +
subtraction -
multiplication *
division /
exponentiation ↑

Parenthesis are often used to make explicit the order in which an expression should be evaluated, although there are specific rules which are used by the computer that make the inclusion of parenthesis unnecessary. For instance, theexpression A/B+C might seem ambiguous; is A divided by B and then added to C, or is B added to C and then A divided by this sum? The order of operations rules clarify this apparent problem. The rules state:

1) All exponentiation is done first.
2) All multiplication and/or division is done second.
3) All addition and/or subtraction is done last.
4) Ordering within each level is from left to right.
5) Parenthesis may be used to modify or simply clarify the ordering presented above.

What then is the meaning of A/B+C? ____________
How would you change this expression so that the entire sum B+C is divided into A?

It is meaningless to simply compute a value without placing the value in one of the containers of the computer, printing it or using it to direct instruction execution. A=E/F*3 is a replacement instruction or assignment instruction. It is termed this because the number found in the container named E is divided by the number found in the container named F. This quotient is then multiplied by three and the result is placed in the container named A. What is the meaning of C1=C2*C3↑2/6 and in what order are the operations performed?

____

```
10  A=1
20  A=A+2
30  A=A+2
```

This sequence shows more clearly why this type of instruction is called a replacement instruction.

1) 10 A=1 — The container named A will have the value 1.

2) 20 A=A+2 — A+2 means take the current value found in the container named A and add two to this value. The result would be 1+2. The instruction further requires that the result be placed back into the container named A. So after this instruction is executed, container A has the value 3 in it.

3) 30 A=A+2 — What will the value of A be after this instruction is executed?

EXERCISES

1) True of False

a) Each print line has five print zones.
b) Every print zone of a print line must contain information before the line can actually be printed.
c) A semicolon is used to change the size of the print zone.
d) A PRINT statement may never end with a comma.
e) The comma in the PRINT statement indicates that the printer is to move to the next print zone.
f) Printing ends whenever the fifth zone has been filled.
g) PRINT 10,20,30 and the sequence PRINT 10,20 PRINT 30 will both cause the same information to print in the same format.
h) Titles can only contain 15 characters because they must not overrun print zone boundaries.
i) Semicolons and commas can be intermixed in any PRINT statement.
j) A semicolon reduces the size of the print zone to 6 spaces.

2) On the imaginary output forms show what would result from each of the following:

a) PRINT 99,732,55

o ______________________________
o ______________________________

b) PRINT "AVERAGE SCALED SCORE", 32

o ______________________________
o ______________________________

c) PRINT 1053; 32; 521, 10

o ______________________________
o ______________________________

d) PRINT 10,5534,
PRINT 925,36

o ______________________________
o ______________________________

e) PRINT 25,7532
PRINT 671,11

o ______________________________
o ______________________________

f) PRINT TAB(2);"THE ANSWER=";TAB(30);7

o ____
o ____

g) PRINT "THE ANSWER=";TAB(20);P   where P contains the value 10

o ____
o ____

3) What will A and $G contain after the statement 10 INPUT A,$G is executed.
Given the students enters 25,"SALLY SMITH" at the terminal

4) List the order in which the operations in the following expressions would be performed.

a) B=A+C-3.0 ____________________
b) C=I*5+J/K ____________________
c) X=X*(Y+Z) ____________________
d) F=(G+K/5.0-7)*.321 ____________________
e) F=G+K/5.0-7*.321 ____________________

5) What is the meaning of each of the following:

a) B=C+D-5 ____________________
b) D=D+3 ____________________

6) What will be the value of A after the following instructions have been executed?

B=3
A=1
C=5

a) A=A+B+C ____________________
b) A=A+3 ____________________
c) A=B*C/5 ____________________
d) A=A+A ____________________
e) A=(B+C*2)/4↑2 ____________________

7) Write a program which will compute and print a child's IQ when his chronological age and mental age are available.
(Hint: MA=(Chronological Age X IQ)/100

8) Kenny was referred to the Northwestern Learning Disabilities Center because of an apparent language problem. The Picture Story Language Test was used as one of the diagnostic instruments. Write a program which will produce a neat record of his test results. Compute the words per sentence (TW/TS), Total Unit (NW+TO), Total Correct (TU-TE) and Syntax Quotient (TC/TU x 100). Your printed output should resemble the following with the appropriate WPS, TU, TC, SQ information included.

Productivity

Total Words (TW)	63
Total Sentences (TS)	5
Words per Sentence (WPS)	_____

Syntax Scores

Number of Words (NW)	63
Total Omissions (TO)	3
Total Units (TU)	_____
Total Errors (TE)	3
Total Correct (TC)	_____
Syntax Quotient (SQ)	_____

9) George was referred to the Northwestern Learning Disabilities Center because of his apparent reading difficulty. He was given the WISC as part of his diagnostic test battery. Write a program which will produce a neat record of his WISC results and which will compute an average scaled score of all of his subtests, an average scaled score for his verbal subtests, and an average scaled score for his performance subtests.

VERBAL		PERFORMANCE	
Information	12	Picture Completion	10
Comprehension	12	Picture Arrangement	13
Arithmetic	7	Block Design	15
Similarities	10	Object Assembly	17
Vocabulary	6	Coding	9

Instructions of a program are normally processed in order; however, there are a few BASIC statements which can be used to alter this normal sequential processing. The GO TO is used to execute an unconditional transfer (transfer automatically to another section of the program) and the IF is used to execute a conditional transfer (a transfer somewhere only if a specified condition is met). These two transfers are analogous to the sentiments presented in the statements:

1) I am going on vacation this summer. (Unconditional).
2) I will go on vacation this summer only if I have saved $1,000 by that time. (conditional)

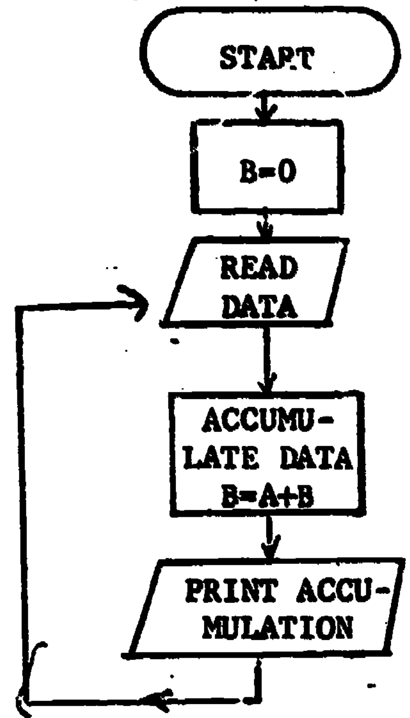
6) GO TO.

FORMAT: line number GO TO line number

EXAMPLE: 10 GO TO 30

This instruction causes an unconditional transfer. This statement causes the instruction at the referenced line number to be executed next. Normal sequential processing will continue from that point.

```
10  B=0
20  INPUT A
30  B=A+B
40  PRINT B
50  GO TO 20
```



Statement 50 causes statements 20-40 to be repeated. This is a classic example of a "loop". This looping operation is the main reason it pays people to write computer programs. A series of instructions need only be coded once but can be executed several times.

It is important to follow the value of B each time the sequence 20-40 is executed. Let's assume that the data entered is A=2, A=8, A=9

	First Execution		Second Execution		Third Execution	
	B	A	B	A	B	A
10 B=0	0	2	-	-	-	-
20 INPUT A	0	2	2	8	10	9
30 B=A+B	2	2	10	8	19	9
40 PRINT B	2	2	10	8	19	9
50 GO TO 20	2	2	10	8	19	9

7) IF

FORMAT: line number I r THEN n

where r is a relational expression and n is a line number

EXAMPLE:

```
IF  I=8 THEN 165
IF  J 2 THEN 20
```

The IF instruction causes a conditional transfer to the line number specified. The relational expression is the portion of the instruction that specifies the condition which must be satisfied if control is to be transferred. If the condition is judged true, the program control transfers to the statement number specified, but if it is judged false, the next sequential statement is executed.

There are six conditions which can be tested in a relational expression. Relational expressions can be used to test whether the value of two expressions are equal, not equal; can be used to test whether the value of one expression is greater than a second, greater than or equal to a second, less than a second, or finally, less than or equal to a second.

The codes used for these relationships are:

=	equal to
<> or ><	not equal to
>	greater than
>= or =>	greater than or equal to
<	less than
<= or =<	less than or equal to

The IF instruction is often used to determine when all the data has been processed. If the programmer knows the exact count of his data cards, he might code:

```
10     IF C1=20 THEN 30
       .
       .
30     STOP
40     END
```

where C1 is a count of the number of records processed. There are 20 records in this example.

A more flexible method, however, for terminating program execution is to enter as the last record one which contains unreasonable data and then to test for this condition. For instance:

```
10     INPUT I
20     IF I=999 THEN 30
       .
       .
30     STOP
40     END
```

where I contains IQ scores and an IQ score of 999 is unreasonable and therefore it is used to signal to the program that it has processed all the data records.

With this explanation you should be able to thoroughly understand the following program.

```
10    REMARK CONVERT IQ AND CHRONOLOGICAL INFO INTO MENTAL AGE INFO
20    C1=0
30    IF C1=3000 THEN 90
40    INPUT A,I
50    C1=C1+1
60    M=(A*I)/100
70    PRINT M
80    GO TO 30
90    STOP
100   END
```

20   C1=0. C1 is initialized to zero in step 20. C1 is being used as a counter so that the program can terminate execution after it has completed the mental ages of thirty children. All counters are first initialized to 0.

30 IF C1=3000 THEN 90. Directs a transfer to statement 90 only after the variable C1 has the value 30. If C1 equals anything other than 30 statement 40 would be the next instruction to be executed. This is the situation the first time statement 30 is executed because C1 will have the value 0 at that time. How many times will statement 40 be executed in this program?

40 INPUT A,I. The INPUT instruction requests the chronological age and IQ information from the user.

50 C1=C1+1. Counts the number of children who have been processed. The first time this instruction is processed the value of C1 will be changed to one, i.e., C1=0+1.

60 M=(A*I)/100. Computes the mental age score from the child's chronological age and IQ information. The chronological age is multiplied by the IQ score. This product is then divided by 100.

70 PRINT M. Prints for each of the thirty children the mental age value which was computed by the program.

80 GO TO 30. Transfers control to the IF instruction to check whether all thirty children have been processed by the program.

90 STOP. Terminates program execution and is executed only after C1=30.

100 END. - This must be the last statement in every BASIC program.

It is important that the student realize that there are usually many ways to solve and program his solution to the problem. This program could have been coded:

```
10  REMARK CONVERT IQ AND CHRONOLOGICAL AGE INFO INTO MENTAL AGE INFO
20  C1=0
30  INPUT A,I
40  C1=C1+1
50  M=(A*I)/100
60  PRINT M
70  IF C1<3000 THEN 30
80  STOP
90  END
```

Do you see why? How does this program differ from the original one?

EXERCISES -- BASIC INSTRUCTIONS

1) Write the BASIC instruction which will cause an unconditional transfer to statement number 25.

____

2) Write the BASIC instruction which will cause a conditional transfer to to statement number 25, based on the condition that the value of the variable B is less than the value of the variable A.

____

3) Write the BASIC instruction which will multiply the sum of E and F by M, and place the result back in M.

____

4) List the six relations which can be tested in an IF instruction.

____

____

5) Write two BASIC instructions which will cause an conditional transfer to statement number 36, based on the condition that the value of the variable Z is greater than the value of the variable X.

____

____

6) Describe briefly in words what is being done in each of the following programs:

a)
```
10 X=0
20 INPUT  A,B,C,D
30 X=X+1
40 A=(A+B+C+D)/4
50 PRINT A
60 IF X<50 THEN 20
70 END
```

b)
```
10  INPUT G,C,M,R
20  G=G+5.2
30  L=(G+C+M)/3
40  Q=(R/L)*100
50  PRINT Q
60  END
```

c)
```
10  C=0
20  INPUT S
30  C=S+C
40  PRINT C
50  GO TO 20
```

7) a) How many times will instructions 20 through 50 be executed in program 6a?

____

b) How many times will instructions 10 through 50 be executed in program 6b?

____

c) How many times will instructions 20 through 40 be executed in program 6c?

____

8) a) Given that the initial values entered into program 6a are A=6 B=10 C=12 D=8, what will the value of A be after statement 40 is executed for the first time? ________________

What numerical value will be printed by 50 PRINT A, the first time it is executed?

____

b) Given that the initial values entered into program 6b are G=5.5 C=10.3 M=10 R=2.5 what will the value G be after statement 20 is executed? ________________ What will the value of L be after statement 30 is executed? ______________

What numerical value will be printed by 50 PRINT Q?

____

c) Given that S=2 the first time statement 20 in program 6c is executed, S=10 the second time, and S=9 the third, what will be printed the first time statement 40 PRINT C is executed?

________________; the second time? ________________; the third time it is executed? ________________________.

9) Identify the correctly coded instructions. For those which are unacceptable to the BASIC programming language, specify the rule which makes them unacceptable.

	ACCEPT.	UNACCEPT.	WHY UNACCEPT.
a) 10 A22=A22+1			
b) 20 INPUT "This program computers IQ scores", I			
c) 2555 INPUT B,C2,C3,C5			
d) 342 PRINT "IQ SCORE", Q			
e) 210 IF A>=∠ GO TO 20			
f) 210 GO TO "NEXT INSTRUCTION"			
g) 310 STOP PROGRAM			
h) 310 PRINT 20,30,40			
i) 270 INPUT 20,30,40			
j) IF B2=<B3 THEN 991			

10) a) The Illinois state regulations considers a child to have failed the Audiometric Screening Test if he does not respond at two or more frequencies in the same ear at the screening level. The state regulation require. that screening be done at the frequencies of 500, 1000, 2000 4000 at a hearing level of 25 dB. Because the frequency range 500-2000 is critical for the acquisition and use of language and speech, it appears that the failure criteria should be more stringent. For example, a child is considered to have failed if he does not respond at one or more frequencies in the 500-2000 Hz range.

Write a program which will list those children who have not passed the screening test, based on this more stringent criteria. ("HINT": You must enter as data a student identification number and a pass-no pass indication for each frequency at the 25 dB level. Try using 1,2,3 as a student identification number and use a code of 0 for no pass and a code of 1 for a pass indication.)

DATA:

Right Ear	500Hz	1000Hz	2000Hz	4000Hz
Child 1	Pass	Pass	Pass	Pass
Child 2	No Pass	No Pass	Pass	Pass
Child 3	No Pass	No Pass	No Pass	No Pass
Child 4	No Pass	Pass	Pass	Pass
Child 5	Pass	Pass	No Pass	No Pass
Child 6	Pass	Pass	Pass	No Pass

If you choose to use an input statement of the form INPUT, I,A,B,C,D then you would enter 1,1,1,1,1 based on the above HINT for child one and 2,0,0,1,1 for child two and so on.

b) Using the above data write a program which will list those children who have not passed the screening test using the Illinois State regulations as a screening criteria.

FURTHER INFORMATION ABOUT THE BASIC PROGRAMMING LANGUAGE

(for those who want to be slightly more accomplished BASIC programmers)

SUBSCRIPTED VARIABLES

Basic allows the programmer to define one variable name to enter a large list of information. This is done with a BASIC subscripted variable. A subscripted variable takes the form of variable name followed by parenthesis which encloses an integer constant. (NOTE the variable name must follow the same naming conventions as presented above for unsubscripted variables, ie, one alphabetic or two characters, the first of which must be alphabetic, and the second a numeric character).

EXAMPLES: K(2)
K3(4)
I(8)

The above examples represent only singly subscripted arrays . However, BASIC does also allow doubly K(2,3) and triply subscripted K(1,3,7) arrays. To better understand subscripted variables, let's study how they can be used to reference a list of numbers. Suppose 44, 48, 46, 48, 45, 32, 36, 36, 30, 38 represented the scaled scores that a child received on the ITPA. One might define array S and have:

S(1)	44
S(2)	48
S(3)	46
S(4)	48
S(5)	45
S(6)	32
S(7)	36
S(8)	36
S(9)	30
S(10)	38

where the variable name S(1) would be used to reference the first scaled scores (44), S(3) to reference the third scaled score (46). How would you reference the last scaled score?______________

DIM

As long as you only plan to reference a list of ten items, you need not tell the computer explicitly that a variable is subscripted. If, however, you plan to use the subscripted variable to reference more than 10 items you must include a DIM statement.

DIM $V_1(L_1)$, $V_2(L_2)\ldots V_i(L_i)$
- where $V_1, V_2\ldots V_i$ is the list of array names which will contain more than 10 items.
- $L_1, L_2, \ldots L_i$ is the maximum number of items each array might contain.

EXAMPLE: DIM A(25), A3(50)

The DIM is the way of explicitly telling the computer that a variable is subscripted. It may appear anywhere in a program.

FOR and NEXT Statements

FORMAT: FOR V = S1 TO S2 STEP S3 - where V = any variable
S_1=initial value assigned V
S_2=maximum value V can reach
S_3=value by which V is increased each time the NEXT statement is executed.
S_1, S_2, S_3 can be any expression.

NEXT V - where V is the same variable specified in the FOR statement.

EXAMPLE

```
FOR X=1 TO 10 STEP 2
.
.
.
NEXT X
```

```
FOR  S=1 TO N
.
.
NEXT  S
```

The FOR-NEXT statements greatly facilites the definition and control of repetitive operations. In general most information processing procedures have repetitive processes inherent in them. It is for this reason that the FOR-NEXT is such an important BASIC instruction. The FOR-NEXT may be best understood by looking at the following examples:

EXAMPLE 1.

```
10   C=0
20   S=0
30   IF C=10 THEN 80
40   INPUT J
50   C=C+1
60   S=S+J
70   GO TO 30
80   next instruction
```

is equivalent to:

EXAMPLE 2.

```
10   C=0
20   S=0
30   FOR K=1 TO 10 STEP 1
40   INPUT J
50   C=C+1
60   S=S+J
70   NEXT K
80   next instruction
```

The FOR-NEXT causes the repeated execution of the instructions following the FOR and preceding the NEXT. In general terms, the FOR statement causes V to be assigned the value S_1, the first time it is executed. Each time the NEXT instsuction is encountered the value of V is incremented by S_3 and a test is made to see if the value of V=S_2. If this limit is reached, the next sequential instruction is executed. If the limit has not been reached the instruction following the FOR is reexecuted. Therefore, in the above example K is set to 1 and each time NEXT K is executed the value of K is increased by one and a test is made to see if K=10 (the limit value). The FOR-NEXT can be shortened when incrementing is to be by ones. You can simply omit the increment portion. For example: FOR K=1 TO 10 could have been used in the above example.

To further study the FOR instruction, let's recode the example presented on page 19.

```
10    REMARK--CONVERT IQ AND CHRONOLOGICAL AGE INFO INTO MA INFO
20    C1-0
30    IF C1=3000 THEN 90
40    INPUT A,I
50    C1=C1+1
60    M=(A*I)/100
70    PRINT M
80    GO TO 30
90    STOP
100   END
```

would become:

```
10    REMARK--CONVERT IQ AND CHRONOLOGICAL AGE INFO INTO MA INFO
20    FOR C1=1 TO 3000
30    INPUT A,I
40    M=(A*I)/100
50    PRINT M
60    NEXT C1
70    STOP
80    END
```

Do you see why?__________________________________

EXERCISES - SUBSCRIPTED VARIABLES, FOR NEXT

1) Identify the correctly coded subscripted variables. For those which are unacceptable in BASIC, specify the rules which makes them unacceptable.

	Acceptable	Unacceptable	Why Unacceptable
a) J(B)	______	______	____________________
b) K2(6)	______	______	____________________
c) 2K(6)	______	______	____________________
d) R33	______	______	____________________
e) M(3,3)	______	______	____________________
f) L(.05)	______	______	____________________
g) Q(18)	______	______	____________________
h) F(3,7,1)	______	______	____________________
i) G9(3,2)	______	______	____________________
j) GM(5)	______	______	____________________

2) Code the DIM statement for the subscripted variable T so that the following information can be stored in T:

.5, 9.6, 10.5, 6.5, 13.3, 10.4, .01, 9.25, 15.7, 17.3, 18, 21

____

3) In the above array T what would be the value of

T(7) ______
T(3) ______
T(12) ______
T(15) ______

4) Identify the correctly coded FOR instructions. For those which are unacceptable in BASIC, specify the rule which makes them unacceptable.

	Acceptable/Unacceptable		Why Unacceptable
a) FOR S=1 TO 20 STEP 2 ⋮ NEXT S	______	______	____________________
b) FOR S=1 TO X ⋮ NEXT 2	______	______	____________________
c) FOR S=1 TO X STEP 1 NEXT X	______	______	____________________
d) FOR T=2 TO 10 STEP 3 ⋮ NEXT T	______	______	____________________

5) How many times will the instructions within the range of the FOR-NEXT be executed?

a)
```
N=3                          answer__________
S=0
FOR X 1 TO 19
S=S+X
NEXT X
```

b)
```
N=3                          answer___________
S=0
FOR X=1 TO N
S S+X
NEXT X
```

c)
```
N=3
S=0
FOR X=1 to 19 STEP 2         answer___________
S=S+X
NEXT X
```

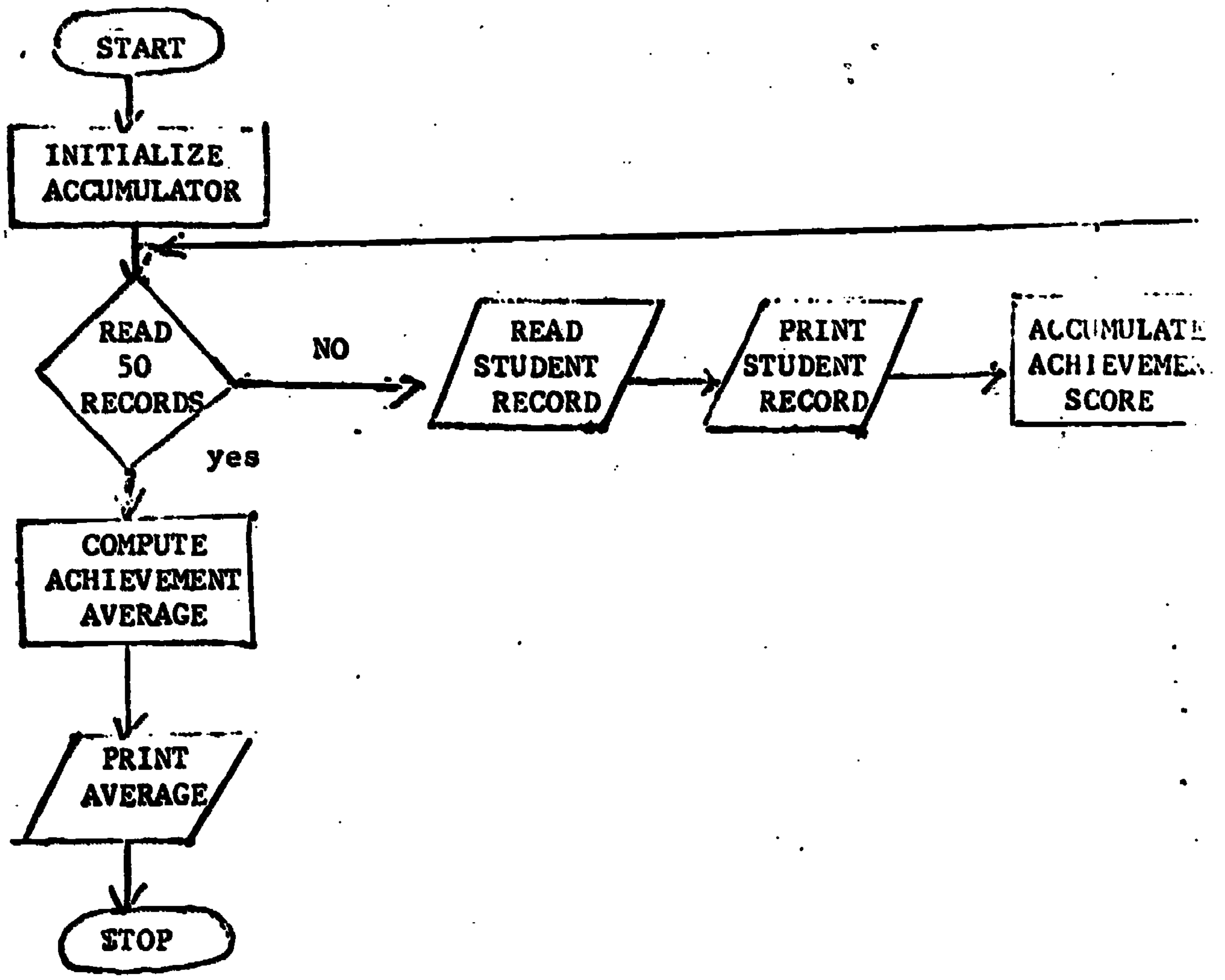
6) Code the FOR NEXT sequence which would be equivalent to:

```
10      I=0
20      INPUT J
30      I=I+1
40      PRINT J
50      IF  I ><5  THEN 20
60      STOP
70      END
```

PROGRAMMING WITH SUBSCRIPTED VARIABLES, DIM AND FOR-NEXT INSTRUCTIONS

EXAMPLE: Write a program which will process the READING ACHIEVEMENT SCORES for 50 children. Compute the mean Reading Achievement Score and print this mean as well as the test record for each child.

Hint: You cannot compute a mean of all the children until all the records are read.




```
10    S=0
20    FOR I=1 TO 50
30    INPUT M$,R
40    PRINT M$,R
50    S=S+R
60    NEXT I
70    A=R/50
80    PRINT A
90    STOP
100   END
```

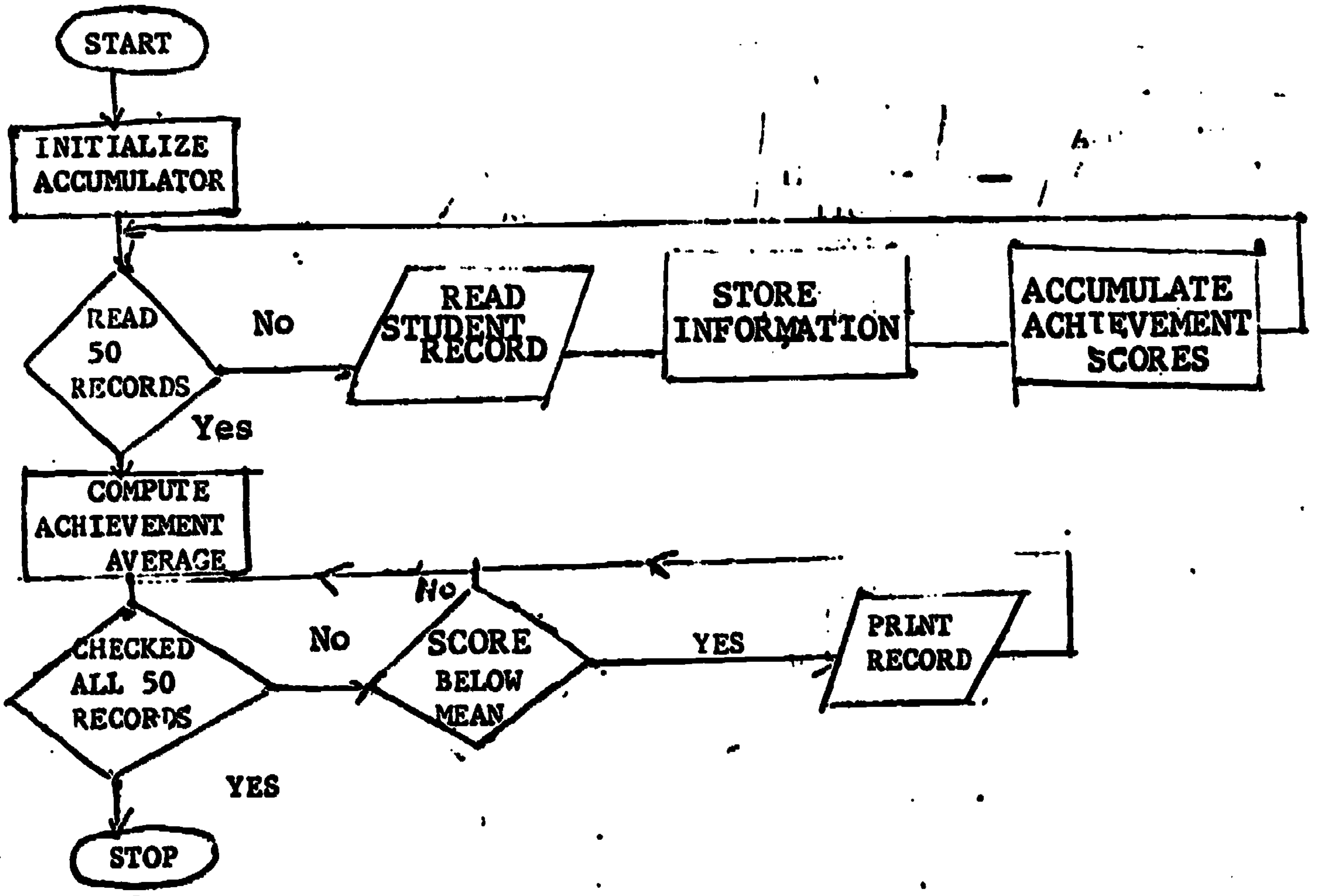
How would this program be altered if one was working with an unknown population size?

```
5      C1=0
10     S=0
20     INPUT M$,R
30     IF R=999 THEN  80
40     C1=C1+1
50     PRINT M$,R
60     S=S+R
70     GO TO 20
80     A=R/C1
90     PRINT A
100    STOP
110    END
```

Looking at a more difficult version of this problem:

Example: Write a program which will process the READING ACHIEVEMENT SCORES for 50 children. Compute the mean reading achievement score and print only the test records for those children who fall below this mean.

HINT: 1) One cannot compute a mean of all the children until all the records have been processed.
2) One cannot determine those children whose scores fall below the mean until after the mean is computed; therefore it is necessary to save this information somehow. It would be difficult to save this information in 50 different variables; therefore one should choose to use subscripted variables.



```
10    DIM  I$(50), R(50)
20    S=0
30    FOR J=1 TO 50
40    REMARK--I$ is the identification, R is the score
50    INPUT I$(J),R(J)
60    REMARK ACCUMULATE THE SUM OF READING SCORES
70    S=S+R(J)
80    NEXT J
85    REMARK--COMPUTE THE AVERAGE
90    A=S/50
95    CHECK FOR CHILDREN BELOW THE AVERAGE
100   FOR J=1 TO 50
110   IF  R(J) > =A THEN  130
120   PRINT I$(J),R(J)
130   NEXT J
140   STOP
150   END
```

What changes would you make to this program if the population size was unknown? ______________________

BASIC PROGRAMMING PROBLEM 1

Jim was referred to the Northwestern Learning Disabilities Center for diagnosis. It was reported that he had difficulty reading. The clinic staff decided to administer the entire Illinois Test of Psycholinguistic Abilities (ITPA) to check for possible auditory or visual processing problems.

Write a program which produces a neat record, with the appropriate subtest names. Compute and print his overall ITPA scaled score average, his auditory-vocal average and a visual-motor average.

Auditory Reception	44	Use these to compute the Auditory-Vocal scores
Auditory Association	48	
Verbal Expression	46	
Grammatic Closure	48	
Auditory Memory	45	
Visual Reception	32	Use these to compute the visual-motor scores
Visual Association	36	
Manual Expression	36	
Visual Memory	30	
Visual Closure	28	

BASIC PROGRAMMING PROBLEM 2

The Almac School system requested that all their teachers complete a pupil behavior rating scale for each member of their class. The school system hoped to use this as part of a total diagnostic battery to aid in the identification of children suspected of having a learning disability. Write a program which will produce a neat record of the pupil rating scale completed by Mrs. Donothing for Tommy Monster, and which computed an average total rating and an average rating for each of the five areas of behavior, i.e., Auditory Comprehension and Listening, Spoken Language, Orientation, Behavior, and Motor.

The rating scale is attached.

DATA for Tommy Monster

Auditory Comprehension
1. Rating of 3
2. Rating of 4

Spoken Language
1. Rating of 2
2. Rating of 2

Orientation
1. Rating of 4
2. Rating of 2

Behavior
1. Rating of 5
2. Rating of 4

Motor
1. Rating of 2
2. Rating of 1

LEARNING DISABILITIES CENTER
NORTHWESTERN UNIVERSITY
EVANSTON, ILLINOIS

PUPIL BEHAVIOR RATING SCALE

Each of the five areas of behavior should be rated without reference to any other. You rate the children on a five point rating scale: the lower the scale, the poorer the performance; the higher the scale, the better the performance. Please put a large "X" on the statement that best describes the child.

The behavior of each child should be considered carefully before he is rated. Your judgment regarding the child's behavior is a highly important part of the total diagnostic battery for identifying learning disabilities. Your assistance in this research is greatly appreciated.

Name________________No.__________
Sex________Date________________
School____________________Grade___
Teacher__________________________

I. AUDITORY COMPREHENSION AND LISTENING

1. Ability to follow directions

1	2	3	4	5
always confused; cannot or is unable to follow directions	usually follows simple oral directions but often needs individual help	follows directions that are familiar &/or not complex	remembers and follows extended directions	unusually skillful in remembering and following directions

2. Comprehension of class discussions

1	2	3	4	5
always inattentive &/or unable to follow and understand discussions	listens but rarely comprehends well; mind often wanders from discussion	listens and follows discussions according to age and grade	understands well and benefits from discussions	becomes involved and shows unusual understanding of material discussed

II. SPOKEN LANGUAGE

1. Ability to speak in complete sentences using accurate sentence structure

1	2	3	4	5
always uses incomplete sentences with grammatical errors	frequently uses incomplete sentences &/or numerous grammatical errors	uses correct grammar; few errors of omission or incorrect use of propositions, verb tense, pronouns	above average oral language; rarely makes grammatical errors.	[illegible]

2. Vocabulary ability

1	2	3	4	5
always uses immature or improper vocabulary	limited vocabulary including primarily simple nouns; few precise, descriptive words	adequate vocabulary for age and grade	above average vocabulary; uses numerous precise descriptive words	[illegible]

III. ORIENTATION

1. Promptness

1	2	3	4	5
lacks grasp of the meaning of time; always late or confused	poor time concept; tends to dawdle; often late	average understanding of time for age and grade	prompt; late only with good reason	very skillful at handling schedules; plans and organizes well

2. Spatial orientation

1	2	3	4	5
always confused; unable to navigate around classroom or school, playground or neighborhood	frequently gets lost in relatively familiar surroundings	can maneuver in familiar locations; average for age and grade	above average ability; rarely lost or confused	never lost; adapts to new locations, [illegible]

IV. BEHAVIOR

1. Cooperation

1	2	3	4	5
continually disrupts classroom; unable to inhibit responses	frequently demands the "spot light;" often speaks out of turn	waits his turn; average for age and grade	cooperates well; above average	cooperates without adult encouragement

2. Attention

1	2	3	4	5
is never attentive; very distractible	rarely listens; attention frequently wanders	attends adequately for age and grade	above average; almost always attends	always attends to important aspects; long attention span

V. MOTOR

1. General Coordination: running, climbing, hopping, walking

1	2	3	4	5
very poorly coordinated; clumsy	below average coordination; awkward	average coordination for age; outstanding but graceful	above average coordination; does well in these activities	exceptional ability; excels in this area

2. Balance

1	2	3	4	5
very poor balance	below average; falls frequently	average balance for age; not outstanding but adequate equilibrium	above average; does well in activities requiring balance	exceptional ability; excels in balancing

BASIC PROGRAMMING PROBLEM 3

Write one program which analyzes the records of five children and which

1) will report a neat record (with appropriate subtest names) of each child's Illinois Test of Psycholinguistic Abilities (ITPA)
2) will compute and print an average ITPA scaled score
3) will determine and print those subtest scores which fall 8 points or more below the child's average scled score

for each of the five children.

DATA:

Child 1 -	A.R.	44
	A.A.	48
	V.E.	46
	G.C.	48
	A.M.	45
	V.R.	32
	V.A.	36
	M.E.	36
	V.M.	30
	V.C.	28

Child 2 -	A.R.	45
	A.A.	29
	V.E.	34
	G.C.	48
	A.M.	43
	V.R.	41
	V.A.	51
	M.E.	40
	V.M.	46
	V.C.	39

Child 3 -	A..R	33
	A.A.	42
	V.E.	45
	G.C.	48
	A.M.	43
	V.R.	36
	V.A.	37
	M.E.	43
	V.M.	46
	V.C.	35

Child 4 -	A.R.	20
	A.A.	16
	V.E.	19
	G.C.	18
	A.M.	27
	V.R.	17
	V.A.	14
	M.E.	27
	V.M.	6
	V.C.	13

Child 5 -	A.R.	27
	A.A.	17
	V.E.	25
	G.C.	25
	A.M.	33
	V.R.	23
	V.A.	28
	M.E.	29
	V.M.	24
	V.C.	25

BASIC PROGRAMMING PROBLEM 4

The Administrators at the Northwestern Speech Clinic would like to evaluate student clinic performance by computer. They are interested in computing each student's average grade as recorded by their supervisors on their Clinic Evaluation Forms. The administrators are also interested in having a list of those students who are performing below average work in one or more of the categories of evaluation.

Write a program which will:

a) Compute and print a student's average score based on the scoring: Superior=5, Strong=4, Average=3, Fair=2, Inadequate=1

b) Compute and print an average score for each category of evaluation using the above scoring technique

c) Note on the printed output all students who have performed below a 3.5 average in one or more categories of therapist evaluation.

d) Compute and print a count of the students who will receive A's, B's, C's, F's, based on the grading criterion.

4-5 = A
3-3.9 = B
2-2.9 = C
1-1.9 = F

The following is a sample of the evaluation form used.

	Superior	Strong	Average	Fair	Inadequate
THERAPY PLANNING					
1. Ability to evaluate patient needs and formulate appropriate quarter goals.					
2. Determining rationale for therapy procedures					
3. Utilization of baseline measures in planning.					
THERAPY MANAGEMENT					
1. Preparation for therapy sessions (lesson plans)					
2. Selection and use of appropriate materials and activities (consistent with goals, age, interest)					
3. Selection and use of appropriate reinforcement procedures (reinforcer schedule, obvious, meaningful)					
DIAGNOSTICS					
1. Ability to determine pertinence of pretest information					
2. Ability to interpret test results					
3. Overall rapport in interviewing					

The following data should be used:

Super. = Superior Str. = Strong Ave. - Average Fair

	THERAPY PLANNING			THERAPY MANAGEMENT			DIAGNOSTICS		
	1	2	3	1	2	3	1	2	3
Therapist 1	Supr.	Str.	Super.	Str.	Str.	Str.	Str.	Ave.	Str.
Therapist 2	Ave.	Str.	Ave.	Ave.	Ave.	Ave.	Fair	Ave.	Fair
Therapist 3	Str.	Ave.	Ave.	Str.	Str.	Str.	Fair	Fair	Fair
Therapist 4	Str.	Supr.	Supr.	Supr.	Supr.	Supr.	Str.	Str.	Str.
Therapist 5	Fair	Ave.	Fair	Fair	Fair	Fair	Str.	Str.	Str.

BASIC PROGRAMMING PROBLEM 5

Write a program which analyzes the files of five children and which will

1) prepare a neat reco:d (including titles) of each child's file
2) compute and print the average verbal, performance, and full scale IQ scores on the Wechsler Intelligence Scale for Children (WISC).
   HINT: (Verbal IQ score child 1 + verbal IQ score child 2 + verbal IQ score score child 3 + verbal IQ score child 4 + verbal IQ score child 5)/5 = Verbal IQ AVERAGE

3) Label in some manner the records of the children who had a discrepancy of <u>more</u> than 6 points between their verbal and performance IQ scores on the WISC.

DATA

Name	Age	Verbal	WISC Scores Performance	Full Scale
C. Hanes	7.3	94	100	98
D. Field	6.5	100	100	100
H. North	9.3	110	120	115
E. Start	10.5	94	110	103
F. End	12.3	100	94	97

BASIC PROGRAMMING PROBLEM 6

Mrs. Mary Jones, a mathematics teacher at Jordan Jur. High, has hired you to assist her in processing her class information by computer. Her most recent request is for you to analyze the results of the class mid term exam. You are to write a program which will:

1) compute and print the class mean on this midterm
2) Prepare two lists, one which will contain the test information of those equal to or above the mean and second, which will contain the test information of those below the mean.

DATA

NAME	TEST SCORE
HANES	83
PROOF	94
MEAN	100
BELT	63
SALTER	76
SEAL	94
GRANT	100
CIDER	61
HANKS	73
SIDES	89
MIDDLE	98
HODGE	43
CARLS	79
HALL	96
CHAR	98
END	65

ANSWERS - to problems found on page 6.

1) a) constant
   b) constant
   c) variable
   d) variable
   e) constant
   f) constant
   g) variable
   h) constant
   i) variable
   j) variable

2) a) acceptable
   b) acceptable
   c) unacceptable. A variable name may only contain two characters.
   d) unacceptable. A variable name may not contain any special characters.
   e) unacceptable. A variable name can only contain a digit as the second character, i.e., 0-9
   f) acceptable
   g) acceptable
   h) unacceptable. A string variable is named with a two character identifier. The first character must be alphabetic and the second must be a dollar sign
   i) unacceptable. A string constant must be enclosed in quotes.
   j) unacceptable. A variable name must begin with an alphabetic character.
   k) acceptable
   l) acceptable

3)
```
10   INPUT A,C
20   C=A+C
30   PRINT C
40   STOP
50   END
```

Any numbering would be acceptable as long as the numbers are assigned in increasing order of magnitude and no two statements are given the same numbers.

4) No, the statement C=A+C must be numbered. All BASIC statements must be numbered.

5) a) F
   b) T
   c) F
   d) F
   e) T

ANSWERS - to problems found on page 13

1)
 a) T
 b) F
 c) T
 d) F
 e) T
 f) F
 g) F
 h) F
 i) T
 j) F

2)
a) o 99-----------732------------55

b) o AVERAGE SCALED SCORE----------82

c) o 1053-----32----521------------10

d) o 10-------------5534-----------925------------36

e) o 25------------7532
 o 671-----------11

f) o-THE ANSWER=------------------7

g) oTHE ANSWER=---------10

3) A will contain 25
 $G will contain SALLY SMITH

4) a) +,-,=
 b) *,/,+,=
 c) +,8,=
 d) /,+,-,*,=
 e) /,*,+,-,=

5) a) Means take the current value found in location C and add to this the current value found in location D. Subtract 5 from the sum and place the results into location B.

 b) Means take the current value found in location D and add 3 to it. Place this sum into location D.

6) a) 9
   b) 12
   c) 3
   d) 6
   e) 13/16 = .8125

7)

```
10      REMARK - PRINT IQ, GIVEN CA and MA
20      REMARK - IQ = MA/CA*100
30      INPUT M,C
40      I=M/C*100
50      PRINT "INTELLIGENCE QUOTIENT=",I
60      STOP
70      END
```

8)

```
10      REMARK - PRINT PSLT RESULTS
20      INPUT W,S,N,O,E
25      REMARK COMPUTE WORDS PER SENTENCE
30      W2=W/S
35      REMARK COMPUTE TOTAL UNITS
40      U=N+O
45      REMARK COMP[illegible]TOTAL CORRECT
50      C=U-E
55      REMARK COMPUTE SYNTAX QUOTIENT
60      Q=C/U*100
70      PRINT "PRODUCTIVITY"
80      PRINT "TOTAL WORDS (TW)=",W
90      PRINT "TOTAL SENTENCES (TS)=",S
100     PRINT "WORDS PER [illegible]ENCE (WPS)=",W2
110
120     PRINT "SYNTAX SCORES"
130     PRINT "NUMBER OF WORDS (NW)=",N
140     PRINT "TOTAL OMISSIONS (TO)=",O
150     PRINT "TOTAL UNITS (TU)=",U
160     IRINT "TOTAL ERRORS (TE)=",E
170     PRINT "TOTAL CORRECT (TC)=",C
180     PRINT "SYNTAX QUOTIENT (SQ)=",Q
190     STOP
200     END
```

9)
```
10    REMARK COMPUTE AVG TOTAL SCALED SCORE-WISC
20    REMARK COMPUTE AVG VERBAL SCALED SCORE-WISC
30    REMARK COMPUTE AVG PERF SCALED SCORE-WISC
40    INPUT V1,V2,V3,V4,V5,P1,P2,P3,P4,P5
50    T=(V1+V2+V3+V4+V5+P1+P2+P3+P4+P5)/10
60    V6=(V1+V2+V3+V4+V5)/5
70    P6=(P1+P2+P3+P4+P5)/5
80    PRINT "VERBAL"
90    PRINT "INFORMATION",V1
100   PRINT "COMPREHENSION", V2
110   PRINT "ARITHMETIC",V3
120   PRINT "SIMILARITIES",V4
130   PRINT "VOCABULARY",V5
140   PRINT " ", "VERBAL AVERAGE=",V6
150   PRINT
160   PRINT "PERFORMANCE"
170   PRINT "PICTURE COMPLETION",P1
180   PRINT "PICTURE ARRANGEMENT",P2
190   PRINT "BLOCK DESIGN",P3
200   PRINT "OBJECT ASSEMBLY",P4
210   PRINT "CODING",P5
220   PRINT " ","PERFORMANCE AVERAGE=",P6
230   PRINT
240   PRINT
250   PRINT " ","TOTAL AVERAGE SCALED SCORE=",T
```

ANSWERS - to problems found on page 19

1) 10 TO GO 25

2) 10 IF B<A THEN 25
   or
   10 IF A>B THEN 25

3) (E+F)*M

4) =, ><, <, >, <=, >=

5) IF Z>X THEN 36
   or
   IF X<Z THEN 36

6) a) The program prints an average of the values entered by the INPUT statement. It has been written to process fifty data cards.

b) The program adds 5.2 to the value originally entered in G. It computes an average of the new value of G and the values of C and M entered with the INPUT statement. It divides R as entered by the INPUT statement by this average and multiplies this quotient by 100.

c) This program accumulates all the data that is entered and prints out each new sum.

7) a) 50 times
   b) 1 time
   c) indefinite number of times

8) a) 9
   9

   b) L=10.43
   Q=24.27

   c) 2
   12
   21

9) a) unacceptable. Variable names can only contain two characters, the first must be alphabetic and the second must be a digit.

   b) unacceptable. Only signed or unsigned numeric constants can be entered by the INPUT instruction.

   c) acceptable

   d) acceptable.

   e) unacceptable. The IF statement requires a THEN   210 IF A>=2 THEN 20
   It will not accept a GO TO

   f) Unacceptable. The GO TO statement must have a statement number following it, it will not accept a string constant.

   g) Unacceptable. The STOP statement requires that nothing follow the word STOP.

   h) acceptable.

   i) unacceptable. Only variables can be used in the INPUT statement

   j) unacceptable.

10)a
```
10   C=0
20   IF C=6 THEN 110
30   INPUT, I, F1,F2,F3,F4
35   C=C+1
40   IF F1=0 THEN 80
50   IF F2=0 THEN 80
60   IF F3=0 THEN 80
70   GO TO 20
80   PRINT I,"500Hz=",F1, "1000Hz=",F2,"2000Hz=",F3,"4000Hz=",F4
90   PRINT
100  GO TO 20
110  STOP
120  END
```

10) b

```
10      S=0
20      C=0
30      IF C=6 THEN 170
40      INPUT, I,F1,F2,F3,F4
45      C=C+1
50      IF F1=0 THEN 100
60      IF F2=0 THEN 110
70      IF F3=0 THEN 120
80      IF F4=0 THEN 130
90      GO TO 30
100     S=1
        GO TO 60
110     IF S=1 THEN 140
        S=1
        GO TO 70
120     IF S=1 THEN 140
        S=1
        GO TO 80
130     IF S   1  THEN 30
140     PRINT I, "500 Hz=",F1, "1000Hz=",F2,"2000Hz=",F3,"4000Hz=",F4
150     PRINT
155     S=0
160     GO TO 30
170     STOP
180     END
```

ANSWERS - Exercises Subscripted Variables, For-Next, page 27:

1) a) acceptable
   b) acceptable
   c) unacceptable - a two character variable name must begin with an alphabetic character
   d) unacceptable - subscripted variables must have their dimension enclosed in parentheses either R3(3) or R(33)
   e) acceptable
   f) unacceptable - the dimension must be a whole number
   g) acceptable
   h) acceptable
   i) acceptable
   j) unacceptable - a two character variable name must begin with an alphabetic character and can only have a numeric character or dollar sign as the second character.

2) DIM T(12)

3) T(7) = .01
   T(3) = 10.5
   T(12)= 21
   T(15)= undefined, no such variable

4) a) acceptable
   b) acceptable
   c) unacceptable. The variable used in the NEXT must be the same as that directly following the FOR. In this example, one should code NEXT S
   d) acceptable.

5) a) 19
   b) 3
   c) 10

1, 3, 5, 7, 9, 11, 13, 15, 17, 19

6)

```
10    FOR I=1 TO 5
20    INPUT J
30    PRINT J
40    NEXT I
50    STOP
60    END
```